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Norman Monuments of Palermo.

AS Mr. Dehli observes at the commencement of his historic sketch of Palermo,* "the Norman conquests in Southern Italy are nearly contemporaneous with the Norman conquest of England." But how different the architectural associations suggested by the mention of the two events. In conquering England the Normans, fortunately for us, brought their own architecture with them, to a great extent at all events. It may be said that they based their work here to some extent on the starting point afforded them by existing Saxon architecture; it is still a moot point (the late Mr. Freeman thought it was not) whether the nave of Waltham represents the pre-conquest church or not; but even if it does, and if other early work sometimes called Norman dates in reality before the coming of William, the influence of Norman bishops had previously been so strong that we may practically say that English architecture was becoming Norman some time before the year 1066. But in invading England the Normans were coming into an island which had no architectural past of any consequence to hamper them, and which had previously been far away from the influence of the architecture and art of civilised countries. But Sicily was in the very centre of antique art and civilisation. On its soil are found some of the earliest and most notable monuments of Doric architecture. Subsequent to the Christian era it had been successively under Byzantine and under Arab possession, though it seems to have been always in a too unsettled state to allow of the elaboration or preservation of any important architectural monuments. The strong hand of the Norman established for some time at least a more settled state of things, and, as in England, so in Sicily, the Norman conquerors soon began to exercise their racial passion for building. But while in England the Norman was the superior artist, in Sicily he was in the presence of races more gifted in this respect than himself, and of mingled Byzantine and Saracenic traditions which were too strong to be obliterated before him. As Pope (with rather doubtful discernment) said of England—

"We conquered France, but felt our captive's charms,"

so the Norman conqueror of Sicily was artistically conquered on that ground, and instead of leaving in the country anything like the ponderous and sturdy but somewhat savage type of architecture with which he covered England, he summoned the artists of various races whom he found upon Sicilian soil to build and decorate for him.

The result is a most significant example of the proverbial reflection in ancient architecture of the political and social circumstances of the time. Here, in an island which had been a successive object of warfare and struggle among Romans, Byzantine Greeks, Arabs, and Norman French, might we precisely expect to find a style which seems to belong completely to none of these races, but to contain elements contributed by all, unless we except the Normans, who were, indeed, the inciting cause of the work being done, and either paid the bill or compelled some one else to pay it, but have left little recognisable outward mark of the characteristics which belong to their architecture elsewhere. It is only in the plan that we find any similarity with northern Norman work; in the Cathedral of Monreale for instance, with its three apses at the end of the three aisles, and the east and west piers of its crossing lengthened out in the direction of nave and choir, as at Tewkesbury; only here, instead of finding mere plain masses of walling, we have them cut up into recesses after the hereditary fashion of Italy. But otherwise the architectural detail is a delicate and highly refined mingling of Italian, Byzantine, and Saracenic feeling, in a result which has its precise counterpart no where else in the world. We may quote the paragraph in which the position is very well summed up by the author. After remarking that the Byzantine tradition had probably more or less spread throughout Italy previous to the period we are now speaking of, he continues—

"The powerful races which in the meanwhile had built up a civilisation on the other side of the Alps gradually worked their way into Italy—the great object of their conquests—but their architecture, in the new climate and under the new conditions generally, assumed new forms. We perceive their own Transalpine elements and the influence of Byzantine art, which they probably superseded throughout — even in Pisa, in Florence, in the work of the Cosmati in Rome, and throughout Southern Italy. The fondness for mosaics must be regarded as a Byzantine feature, and especially so marble mosaics in geometrical patterns (*musaici di pietri duri*), and the practice of inlaid mosaics on marble. We recognize two schools,—Roman and Byzantine — and remember in this connexion the magnificent mosaics in Pompeii which easily account for the origin of the former; in fact I remember being struck by the apparent identity of certain predominant shades of colour in Pompeii and in the Baptistery of Ravenna, which suggested to me an unbroken tradition in the manufacture of the tinted glass (*smalti*). Thus we find at the time when the Normans gained foothold in Palermo, throughout the rest of Italy, then slowly rising from centuries of humiliation, an established architectural tradition with numerous local variations developed from the three Mediæval derivations of Greeco-Roman art; the early Christian or Classic Romanesque, the Byzantine, and the Transalpine traditions, besides which a fourth element, the Arab, is found at Palermo, and on the Continent, at Amalfi and Ravello, on the peninsula of Sorrento. The latter was originally developed from the Byzantine, but with a system of decoration thoroughly Oriental, and at the time of the Arab conquest of Sicily was fully developed as a separate tradition or style."

This is a very good summary of the elements and genesis of the Siculo-Roman style, to which the Normans really seem to have contributed little more than the impulse

* "Norman Monuments of Palermo and Environs; a Study." By Arne Dehli, architect; assisted by G. Howard Chamberlain, architect. Boston: Ticknor & Co. London: B. T. Batsford. Leipsig: Karl W. Hiersemann.

which furnished the occasion for the development of this beautiful and picturesque combination of styles in the shape of important and richly decorated buildings.

Mr. Dehli, who in spite of his continental-looking name is we presume an American architect, as his publishing head-quarters are Boston, has produced a very careful and admirably-drawn series of illustrations of the works which he has made his study. A few of the illustrations of exteriors and interiors are reproductions from photographs, but the majority are careful and cleanly executed line drawings from measurement, and form a valuable record of the detail of the various buildings referred to. Some of the most important illustrations are from the Cathedral of Monreale, and in particular an admirable photographic reproduction is given of some of the clustered columns of the cloister, an illustration which entirely bears out the author's view that the shafts are later than the arcade. The arcade itself is late in the period, as indicated by the heavy mouldings of the arches, in contradistinction to the prevalent flat soffit of the earlier buildings, showing a distinctly northern influence and a feeling more approaching to Gothic work. Mr. Dehli regards these arches of the cloister, however, as of the same date with the main building, with which they coincide in general style, and which is in the main a late example of the period. But the contrast between the arch-mouldings and the columns is too striking to leave any doubt as to the later insertion of the latter. The heavy roll-moulding of the arch seems ready to crush the thin abacus and delicately worked capital, and moreover projects considerably beyond the capital in a manner in which no builders would ever have left it if the two had been worked at the same time. Mr. Dehli is probably right in his conjecture that the mouldings were originally continued down to the plinth or base-course on which the bases of the shafts now rest. The piers have been cut away and the clustered shafts inserted in their place. The most curious point about this bit of work is the strongly-marked Byzantine character of some on this inserted work. The capitals have a certain degree of Byzantine feeling in them, though not quite so strongly marked; but the clustered shafts in the foreground of the illustration, which are entirely carved in low relief, are singularly Byzantine in character, more especially in the animal forms introduced. The main ornament consists of intertwined strap-work or surface mouldings which are more or less Roman in the arrangement of their lines, intertwined so as to form large and small circles alternately, these circles being mostly filled in with rudely sculptured animal forms in rather flat relief, squeezed up and contorted to fit into the circles in a very Byzantine manner. Certain of the circles, on the other hand, are filled up with symmetrical rosettes, of almost classic character, while in others we see the Byzantine variation on the classic acanthus—a leaf severe in its pointed outlines, and sunk into a V section on the surface. Altogether a curious amount of architectural history is suggested on the surfaces of these sculptured columns. The square-headed doorways of the church are almost frankly classic in character, except that the place of the moulded architrave is supplied by a flat inlay of mosaic, some of the details of which much resemble some of the inlaid work on the Florence Campanile and on some other thirteenth-century buildings, and are perhaps not far from them in date.

The cloisters of S. Domenico in Palermo give us some capitals of very decidedly Byzantine outline and carving of flatly treated foliage. A more curious example is the column in the nave of the Capella Palatina at Palermo (Plate XII.). Here we have a capital which roughly imitates the classic capital, with two orders of leaves, and scrolls above meeting at the angles, and with scrolls turned inwards to meet in the centre of the face, as in some typical examples of Corinthian capital; but the lines of the leaves are perfectly straight and stiff save for the slight curl over at the apex, and slope or expand outwards from the necking upwards, thus giving approximately the common outline of the true Byzantine capital, while the details are an imitation of the classic capital. The abacus is clumsily moulded and very heavy, while the base is a pure attic base.

In the organ-gallery at the Capella Palatina (Plate XVIII.) we have another curious assemblage of detail. The balustrade of the gallery is decorated with mosaic in which the prominent feature is a large ornament of intertwined bands forming circles, according to a common Roman device, but filled in the centre with very Byzantine-looking crosses. Of the three columns supporting the gallery, shown in the drawing, one has a capital of rather coarse classic character, with a column of nearly classic proportions (rather thicker than the true classic column), and covered with a zigzag ornament worked in relief on the surface; the same idea as the zigzags on some early Norman columns in this country, but carried out in a different manner. The next column is a plain shaft of much more slender proportions, with a clumsily-designed classic base and capital, the base-mouldings much too large for the scale of the column; and the next is a pilaster, with ornament in the panels which is classic in the upper panel, and of Byzantine type in the lower one, while the capital has one of the characteristic Byzantine forms of outline, a convex bulging from near the necking, and the ornament on it is a mixture of classic and Byzantine detail. The whole thing has the effect of being pieced together from the remains of various buildings of different date and place, though it may very possibly have been all erected at one time.

Other illustrations in the Second Part illustrate further the shafts and capitals of the Monreale cloister, and form an interesting collection of the peculiarities of this collection of details, all of them rich and beautiful, but looking like a museum of experiments in the treatment of a cloister, rather than work deliberately carried out on a preconceived scheme.

The literary portion of the book, though short and condensed, is well written and thoughtful, and contains a good many suggestions worth consideration in regard to the history and peculiarities of the twelfth century architecture of Palermo and its neighbourhood.

NOTES.

THE method of enlarging the House of Commons which is illustrated and explained by Mr. Charles Barry in a communication to the March number of the *Nineteenth Century*, is so completely the best that has been proposed, in regard to simplicity and avoidance of any unnecessary cutting up of the existing building, that it may be considered as the one which is likely to be carried out if any such scheme is. Mr. Barry proposes to remove the longitudinal walls at each side of the present chamber, carrying the roof on longitudinal girders, and extending the House on each side into the space now occupied by the division lobbies, these latter being provided for by a further extension encroaching to some extent on the space occupied by the Commons Court and the Star Chamber Court, but not in such a way as materially to interfere with any important light. The enlarged House would practically be turned round, *i.e.*, its greatest length would be at right-angles to the centre gangway opposite the Speaker's chair instead of parallel to it; the seats would be arranged, however, on the same lines as at present, parallel with the centre gangway, and arranged on two inclined planes facing each other and rising from the centre gangway to the walls. The seat space obtained in this way would provide a seat for every member on the floor of the House, with the important advantage that no member would be much further from the Speaker's chair than are those who occupy end seats in the present House. The Reporters' gallery would be enlarged; and Mr. Barry calculates that while in the present House 430 members have a cubic space of 296 ft. each, in the House as proposed 670 members would have 343 cubic ft. of air space each. The method of alteration is one which could be carried out without interference with Parliamentary business. The preparations for the enlargement could be made during one recess, leaving the walls for the present intact, and the removal of the walls and the finishing and furnishing of the enlarged chamber carried out in another; and the scheme affords a satisfactory answer to the absurdities of men like Mr. Labouchere, who would without scruple pull down the present world-famed building to provide a common-looking chamber in which every member should have a seat. Nevertheless, we are of opinion that the House of Commons would be wise to think twice before enlarging its tabernacle. In the present House an average speaker can render himself audible without difficulty: in a chamber practically more than twice the size he could not. Speaking has to go on every day, during the Session; a gathering of all the members, all wanting seat-room at once, happens but rarely. Members might find that by enlarging the House in their desire to provide against a temporary and occasional inconvenience, they had subjected themselves to a permanently increased tax on their physical endurance which would prove the more serious evil of the two.

TO the same magazine (*Nineteenth Century*) Mr. T. G. Jackson contributes an article in reply to that by Lord Grimthorpe, who he is obliged rather reluctantly to admit as an ally, in regard at all events to the destructive side of the criticism of himself and his friends on the Institute of architects. The article contains however some very neat hits at Lord Grimthorpe, neater perhaps than the object of them will altogether realise. The concluding page of the article is a very good *resumé* of what has been often urged before, by those who give any thought to architecture, as to the importance of studying architecture as a living art and not as an imitative one. That in the present day it is very difficult to do this is, however, evident from the amount of imitation of old styles which we find in many of the works even of those who most ardently, and we have no doubt sincerely, deprecate the system. We may add that those who most respect Mr. Jackson both personally and as an artist must regret that he should have thought it necessary to ally himself, as by implication he does, with the author of the foolish and dishonest article in the last number of the *Quarterly Review*, which was simply an endeavour to discredit the Institute of Architects and all its ways by absurd exaggeration and a misrepresentation of facts. Surely in this matter Mr. Jackson and his friends might have found it more dignified to say, *non tali auxilio*.

THE new number of the German Archæological "Jahrbuch" (1892, part 4) is rich in contributions to the history of ancient sculpture. Dr. Milchhoefer discusses the beautiful female statue found at Epidaurus, and currently known as the Epidaurus Aphrodite (Cat. Central Museum, Athens, 121). Its chief claim to the name has been that it represented a woman clad in a close-fitting transparent *chiton*, which recalled the drapery of the Venus Genetrix type. The statue, however, always presented one difficulty—over the right shoulder is passed a belt, which must have supported some weapon. This has led to an attempt to identify her as a Mænad who might

be supposed, accidentally, to be carrying a knife or sword. Dr. Milchhoefer solves the difficulty by interpreting the statue as Dike, Justice, who, alone of women figures, rightly carries the sword as her regular attribute. She is so represented on the well-known under-world vases. Moreover, at Epidaurus, and, so far as we know, there only, there was a regular cult of Dikaiosyne, the same personality, attested by an inscription. The statue of Dike may well have stood in the shrine of her mother Themis, which formed one of the complex of sanctuaries at Epidaurus. Another paper of great interest is that by Dr. Six, of Amsterdam, on the statue seen by Pausanias near the Propylæa, of a wounded man pierced by arrows. The statue has a double interest—it was made by the famous sculptor, Kresilas, and we possess the actual basis which still stands approximately *in situ* (figured in "Mythology and Monuments, Ancient Athens," p. 387). Pausanias made the mistake—a not unnatural one—of supposing that the statue represented Diitrephes instead of his more famous father, Hermolycus. The interesting point is that in the de Luynes collection of the Bibliothèque Nationale at Paris, Dr. Six has discoverd a vase painting which gives us a copy of this very statue of a man falling pierced by two arrows, but still fighting with his spear, just as they describe the statue, *volneratum deficientem in quo possit intelligi quantum restet animæ*. The position of the figure on the vase just accords with the curiously placed attachment marks on the basis. Moreover from the technique it is manifest that a bronze statue is copied. In this vase therefore we have our best clue to the style of Kresilas, who seems to have made a specialty of wounded figures, as it will be remembered he made also a wounded Amazon. Space forbids us to do more than note a very valuable article by Dr. M. Mayer, in continuation of his Mycenæ researches.

THE question of the contract for the Woolwich ferry boat again came before the London County Council on Tuesday. The question has more than usual interest because it exemplifies the certainty that where a body interested with the management of public affairs endeavours to benefit one class at the expense of the community a conflict must ensue. We have before this occasion commented on this same matter, in which the struggle was between accepting the lowest tender in the public interest or a higher tender in the interest of London artisans, and fortunately the public interest won the day. On Tuesday the question arose whether Messrs. Simons's tender should be finally accepted or whether the matter should be gone into again because Messrs. Simons wished to modify the standing order of the Council with regard to contractors paying trades union rate of wages by adding the words "except so far as the rate of wages and hours of labour may vary in the Clyde district." In other words, facts were combating theories, and the theory that the Council could regulate the fair rate of wages has had to go down before hard facts. The Council adopted the Scotch contractors' modification, and thus, in effect, modified their own general resolution on one of the first occasions when it could be seriously tested. It is pretty clear that as time goes on it will be found that many of the theories put forward by the advanced members of the County Council are incompatible with the public interest and sound business and economical principles. We therefore look forward to the day when the Council, having passed through a period of probation, and having shed its shallow theories and its philosophers, will become a practical assembly of business men of moderate principles.

WE are glad to learn from a paragraph in the *Times* of Thursday that some petitions are to be presented to Parliament against the one-sided and inconsiderate course proposed to be taken in regard to removal of all street gates and bars in London. The Duke of Bedford, in a petition on this subject, alleges with perfect truth that the Bill prejudicially affects the rights, property, and interest, of himself and of his lessees and tenants; and a petition from the trustees under the will of the fourth Duke of Portland objects to the removal of the gates in Park Crescent, Harley Street, and Devonshire Place, the erection of the gates and the restriction on traffic having been the subject of an express Parliamentary contract. The onus of the Bill lies in the proposal to remove these gates without compensation to tenants or ground landlords, in defiance of the obvious fact that their existence makes a great difference in the value of residental property. And even apart from the question of compensation, it is very doubtful whether public interest, in the widest sense, requires the removal of all of these gates. Many of them are practically no obstruction to public traffic, they only compel vehicles to take another course which is just as convenient, and prevent them from needlessly and wantonly destroying the quiet of a residential street. The residents in such streets are a portion of the public of London, and a more important portion than many of those who are clamouring for the removal of the gates. Why are not their rights and claims to be considered just as much as those of the people in the street?

OUR attention has recently been drawn to a new artificial sandstone, of German origin, which has now been placed on the English market, and is worthy of a short description. It is known as one of "Moehle's Building Patents." Unlike many other artificial stones, it does not require much preparation before being ready for use, and indeed it would, perhaps, be better described as a new form of cement than as a building stone properly so-called, though the product closely resembles in appearance certain kinds of natural sandstone. In its preparation blast furnace slag of the special kind obtained in the manufacture of foundry pig-iron is granulated by being run off into water, then finely pulverised and thoroughly mixed with cement, with or without the addition of soda, in the proportion of one part cement, one to three-tenths part soda, to one to eight parts pulverised slag. This mixture is moistened with only as much water, as to be just damp enough to work, and is then rammed firmly into iron, wooden, or gypsum moulds. The moulds are removed immediately after the ramming, or, preferably, after the lapse of from one to five hours. When it is desired to produce a coloured stone, the requisite colouring mineral matter is added to the mixture of slag powder and cement. For rough work, and also for the inside of shaped blocks, gravel or small pieces of slag may also be added. According to tests made at the Royal Academy of Charlottenburg this artificial sandstone increases in strength for some time after it is made. After seven days samples withstood the pressure of 3,723 lbs. per square inch, after twenty-eight days 5,147 lbs., and after ninety days 6,227 lbs. The patent composition for making the stone is forwarded to the building site in bags or barrels, and local sand or gravel may be used. Moreover, the builder may mix his own cement with the composition. It is said that the material is very durable, and whilst we do not desire to dispute this statement, it may be well to bear in mind that it has not been long enough in use to enable us to judge of its durability from a practical point of view. Under the microscope it certainly appears to be compact, and the materials of which it is composed bind firmly together. There seems also to be a slight proportion of iron present, though this is probably not sufficient in quantity to seriously interfere with the weathering of the stone. A sample of the powdered compound, ready for mixing, contained quartzose grains, which would have been more suitable for the purpose were they sharp or angular. The question of durability must also be governed to a large extent by the quality of the cement used. The stone, no doubt, would be durable when the best cement and sharp grit or sand were used, for the nature of the "patent composition" is such as to constitute a valuable addition to good cement; but when we learn that builders are allowed to buy the composition, and to add cement of their own choosing,—for that is practically what it amounts to,—we fear that the enduring qualities of this artificial sandstone will be found to vary considerably.

ANOTHER of "Moehle's Building Patents," also recently introduced into this country, consists of a peculiar method of lining shafts and wells by means of specially-formed blocks of concrete. The underside of each block, or segment, has a semi-cylindrical projection running along it, with a groove on either side, whilst the top of each block has a semi-cylindrical channel, the two vertical sides having each a fluting. When placed in position in building, the projection at the bottom of the block fits into the channel on the top of the corresponding block beneath, and the whole is firmly set in concrete. Further, each block has a hole running through the centre from top to bottom, and the sides of the block are grooved so that when two blocks are placed side by side a hole is formed into which the cementing material is rammed. In building, the blocks are so arranged that the hole running through always comes in a straight line with, or is directly over, the hole formed by the grooved sides on the junction of the blocks. Besides materially assisting in the general construction of the well-lining, one or more of these holes is fitted with iron tubing in cases where much water is met with in sinking. The advantage of this will be at once seen, for the water, which would otherwise try to force its way into the shaft, is enabled to be conducted up the tubing to the surface, and thus a considerable proportion of the pressure at the sides is relieved. Where that pressure is very great, and the necessary hydrostatic conditions prevail, the water finds its way up the tubing to the surface unassisted. Many modifications may be adopted in building, such as providing the well or shaft with two linings, one within the other, leaving a space between to be filled with concrete, &c. The blocks may be made near the spot where they are required; the concrete is rammed into cast-iron moulds, the shape of which corresponds to the diameter of the shaft. This invention will prove useful in well and shaft sinking, especially in cases where there is much influx of water.

IN the course of next Spring the ground lease, fifty years unexpired, of Campden House, Kensington, will be offered for sale, at the Mart. The mansion stands within its own well-timbered grounds, four acres in extent, and about 120 ft. above the river level. The ground lease contains no restriction against building other than that houses shall not be of value less than 30*l.* a year, nor is it covenanted that the present house, which was built about twenty years ago, shall remain. The District Railway line passes beneath the property. The original house, containing thirty rooms, a theatre, and a picture-gallery, was destroyed, together with its costly contents, by a fire that broke out early on Sunday morning, March 23, 1862, being then occupied by Mr. W. F. Woolley.* It had been built, *circa* 1612, for Sir Baptist Hicks, the wealthy mercer of Cheapside (who was elevated to the peerage as Viscount Campden), on the heath near the

* See the *Builder*, March 29, 1862.

old Gravel Pits, which, it is said, he won at play from Sir Walter Cope. Cope was then lord of Kensington manor by purchase from Archibald, seventh Earl of Argyll, and his wife, Anne, daughter and heiress of Sir William Cornwallis. The house was constructed of red brick, with stone coigns and mullions, having three bays in the main (south) front, surmounted by a stone balustrade, and attic floor, and flanked by two square towers with pyramidical roofs—somewhat after the style of Holland House, built by John Thorpe for Sir Walter in 1607. The grounds extended further southwards than they do now; the avenue of elms reaching to the new graveyard west of the parish church, is drawn in Rocque's map of 1764. In 1691 Princess Anne rented the house, and there lived five years with her son, named Duke of Gloucester by William III., the story of whose childhood has been written by his servant, Jenkin Lewis. For Anne's retinue was built (and some say by Wren) the adjoining house, The Elms, now called Little Campden House. The Elms suffered damage from the fire of 1862. It was then tenanted by A. E. Egg, R.A., and was afterwards the home of Mr. and Mrs. Alfred Wigan. Campden House passed in marriage to the Noels, and then to the Boyles, and there Richard, third Earl of Burlington, the architect, spent his boyhood. In 1719 the Boyles sold the estate to Nicholas, afterwards Baron, Lechmere, satirised in the ballad "Duke upon Duke" written by Swift or Gay, from whose representatives, after a long Chancery suit, it was bought by Stephen Pitt. Pitt had married the heiress of the Orbell who built Orbell's-buildings—two houses (but now thrown into one), in one of which, since called Bullingham House, Sir Isaac Newton lived, though not continuously, from January, 1725, until his death there on March 20, 1727. That house appears in our illustration, July 10, 1886, of the Carmelite Monastery. Pitt broke up most of the park, cut off the old house from the new, and shifted the gate-piers to their present position in Gloucester-walk; the eastern pier still carries its original greyhound. Faulkner gives a view of Campden House in his "Kensington," 1820; by that time the front had been stuccoed over, and had lost most of its ornamentation, including the parapet and the tower roofs. In the re-building the main features of the front elevation, with the towers, appear, but five curved gables replace the parapet. We are informed that the District Railway Company own the freehold of this site.

APROPOS of the sanitary condition of some of our city churches, upon which we have commented of late, as occasion arose, we find that application has been made to the Consistory Court for a faculty to remove the remains from beneath the floor of St. Michael Bassishaw church. At their meeting last week, the City Commission of Sewers resolved, at their Sanitary Committee's instance, to reduce the fees from 3s. to 1s. 6d. per ft. superficial for the ground, and from 1*l* to 15s. for the interment of each coffin, as may be removed to Ilford Cemetery from St. Michael's. That church was rebuilt of brick, with a tower, since cemented on face, by Wren, at a cost of 2,823*l*., on the site of one erected in the middle of the fifteenth century which had replaced the church founded *circa* 1140, and bestowed by Henry III. upon Adam Basing, a member of the family who gave a name to Basing (afterwards known as Bakewell) Hall and to the ward wherein the church stands. In 1697 the interior was repaired and beautified. Hatton mentions the burials of Sir John Gresham and his brother, Sir Richard, elected Lord Mayors in 1547 and 1537 respectively. The latter was father to Sir Thomas, founder of Gresham College, for which new buildings were erected in Basinghall-street in 1842-3, after the late George Smith's designs. The late George Godwin thus describes the fabric in his "Churches of London":—

It was completed in 1679, and is a plain substantial building, without any striking features. The length within the walls is 70 ft., the breadth 50 ft., and the height 42 ft. A description of the interior will not occupy many lines. Corinthian columns, thinly set, supporting an ugly entablature, divide it into three aisles. The ceiling is camerated, and formed into panels, having also openings on each side for light to the church. In each of the side aisles there are windows, and at the east end, above the altar-piece, was formerly a very large window, now stopped up.

MR. T. W. THOMPSON'S report to the Local Government Board on the general sanitary condition of the York Rural Sanitary District, dated January 14 of this year, deals with the sanitary condition of a considerable tract of country, containing forty-seven villages, each of which is briefly reported on. The general condition of the district is summarised in the body of the report, and the following quotations suggest that there is much need for improvement:—

"Speaking generally, the water supply must be said to be of a very unsatisfactory character. With the exception of some parts of the district contiguous to the city, such as Fulford Gate, Dringhouses, and Clifton, which are supplied from the mains of the York New Water Works Company, the inhabitants are dependent upon wells, or, as in a relatively few cases, on springs. Almost all the wells are, I was informed, merely dry steined, and this was certainly the case with regard to all but one or two of those which I had an opportunity of inspecting internally. They must therefore, as a rule, be looked upon as open to the admission of water from the superficial layers of the soil; indeed in not a few cases percolation of this kind was seen to be taking place. Inasmuch then as these wells are in very many instances situated within short distances of privies, middens, foldyards, and pigsties, it may be safely concluded that numbers of them are polluted. The likelihood of their being polluted, too, is increased by the fact that over the greater part of the district they are sunk in porous soil, such as sand or gravel. Proximity to the foldyard is an extremely common defect in the position of farm wells in this district; in some cases wells were found actually within foldyards. Many of the cottage wells are recognised by the tenants as being polluted, and with regard to others, it was said that the water was thick or bad after rain.

Most of the villages in the district have sewers of some sort. Where these sewers have been recently put down, they consist of socketed 'sanitary' pipes, but in the larger number of instances they are old 'tile' pipes, sometimes socketed and sometimes not, often, no doubt, put down originally for storm water alone. In certain cases they were said to be merely tile drains without bottoms. . . . The sewers generally are without any proper arrangements for inspection or flushing, and are usually deficiently ventilated. Some, apparently, are not ventilated at all. . . . The sewage in all cases, except at Clifton, where it goes into the city system, is discharged in a crude state into rivers, streams, or ditches, and ultimately finds its way into one or other of the large rivers which run through the district. . . . Except as regards the larger houses, where water-closets are employed, the usual mode of excrement and refuse disposal is by midden privies. A very large number of middens are roofed over, but many were found still uncovered. Some of the more recently constructed middens have been rendered in cement, but the older ones, as a rule, are not so constructed as to prevent the soaking into them of surface water, or the percolation of their contained liquid filth into the surrounding soil. Many were found large, deep, wet, and offensive. . . . Not a few privies or middens were found adjoining, or very near to, dwellings. Accommodation for the deposit of ashes and house refuse was sometimes either absent or of very defective character. In the former case ashes and house refuse were found heaped up in the garden."

The report concludes by pointing out that since it was drafted the extensive prevalence of cholera on the Continent has added a fresh danger to those parts of the country characterised by unwholesome conditions and defective water supply, and that if the York Sanitary Authority do not avail themselves to the utmost of the interval before the hot weather, to improve the sanitary condition of their district, "they will be incurring a responsibility the gravity of which it would be difficult to exaggerate."

THE first of the series of lectures on matters connected with building given annually in the Carpenters' Hall, delivered by Professor J. M. Thomson, on February 22,* on the subject of "Pigments and Protective Agents," was a kind of supplement to his former lecture upon the "Chemistry of Building Materials." He dealt at some length upon the change of colour in pigments, showing that this may be brought about (1) by change in molecular condition, (2) by loss of water of combination, or (3) by change in chemical composition. To illustrate changes of the first description he painted some sheets of drawing paper with mercury and cobalt colour respectively and warmed them over a gas-burner. In a few moments the mercurial pigment had changed from vermilion to a light yellow, while the cobalt compound changed from a black or dirty slate colour to a bright green. He pointed out that no alteration had been effected in the composition of the compounds, but that the change in colour was entirely due to a change in their molecular condition. To demonstrate change of colour produced by dehydration he subjected some "blue stone" or copper sulphate to distillation and called attention to the fact that as the water of crystallisation or combination was driven off the copper sulphate lost its colour and remained as a white powder. In illustration of the third cause of change of colour the lecturer showed the rapid discharge of colour produced by the oxidation of potassium permanganate, and also the alteration in the colour of precipitates manufactured with ferr*ous* salts, remarking that in the latter case the rapid change was due to the oxidation of the ferrous compound into a ferr*ic* compound by the oxygen of the atmosphere. Passing on to the manufacture of pigments by precipitation, Professor Thomson said that white lead may be made very rapidly by precipitation, but that the product was inferior in "body" to that obtained by the old "Dutch" process. He illustrated the manufacture of lead carbonate by the precipitation method by passing carbon dioxide gas into a solution of basic lead acetate. He considered that in many cases the slower the process of manufacture the better is the resulting pigment. Referring to the action of sulphuretted hydrogen upon white lead, he said painters who had been careful not to use a lead pigment were sometimes puzzled by the subsequent discoloration of their paint. The fact was, lead was often to be found in the "driers" employed, and this was likely to be the cause of the trouble. With regard to the poisonous pigments he said that the most injurious were those containing copper or arsenic salts, and that, although barium was also poisonous, the compound most commonly employed—barium sulphate—was so insoluble that the small amount that might be taken into the system from a wall paper or wall painted with this compound would probably not be sufficient to produce symptoms of poisoning, but would pass through the system unchanged. Professor Thomson then showed some experiments by which arsenic in wall paper or pigments may be detected, but these have recently been fully described in our "Student's Column."

ON Wednesday last, Professor Silvanus Thompson delivered the second of the Carpenters' Hall lectures for 1893, Sir Jas. Clarke Lawrence being in the chair. The subject was "Electric Lighting from a Popular Point of View," and it was, perhaps, inevitable that the lecture should have much in common with those on the same subject recently given by the Professor at the London Institution, and noticed at the time in these columns. The lecturer said that he did not intend to mention that night either frictional or voltaic electricity, but would only consider that mode of producing a current based on mechanical action. He warned his

* This note was unavoidably postponed from last week.

audience that it was not electricity that was produced at a station, any more than water was created by a water works company. Electricity was everywhere, the business of the companies was merely to pump it round the circuit in a current. After sketching the evolution of the dynamo, which word, he said, was invented by Dr. Werner Siemens to indicate the origin of the current, the Professor called attention to the curious fact that the dynamos used in the arc lighting of the City at the present time, namely, the Brush machine, which lights the west end of the City, and the Thomson Houston, which lights the east end, were both of American origin, and were both early types, having been invented in 1878, and but little modified since. The lecture was illustrated throughout by lantern slides, and by experiments with instruments and apparatus lent by the City of London Lighting Co., and by Messrs. Rindwanger: but, since the slides and experiments were the same as those used in the London Institution course, it is unnecessary to repeat our account of them. The Professor dwelt especially on the difference between English and American practice in the method of driving. "The Americans hold," he said, "'that there is nothing like leather,'" but the English practice is more and more in favour of direct driving, and, even when pulleys are used, they prefer ropes to belts. This was illustrated by plates showing the Westinghouse Station in London, which is on the American plan, and contrasting it with the Deptford Station and a station at Bath, which, he said, was nearly on the same plan as that at Bankside, from which came the current he was then using. In conclusion, the lecturer expressed his confidence that the price of electric energy would fall greatly with extended use; and pointed to electric heating and cooking, as likely to lead to a demand for the current in the daytime.

WE are glad to hear that the Architects' Benevolent Society has received a most welcome addition to its funds by the bequest of 500*l.* under the will of the late Mr. John Gibson. During his life Mr. Gibson was a liberal donor and subscriber to the society, and this bequest will be an important addition to the invested capital, the further increase of which, by donations and bequests, would warrant the conferring of additional pensions beyond those which the limited means at the disposal of the council now enables them to grant. The income available for the relief of urgent cases is mainly dependent on the annual subscriptions, and a large addition of subscribers would greatly benefit those who, by reason of adverse circumstances, are compelled to apply for relief in their distress.

THE drawings to which prizes have been awarded by the Institute are now being sent round for exhibition to some of the provincial architectural societies. The Dundee "Institute of Architecture, Science and Art" has issued a special circular to its members recommending the exhibition of prize drawings to their attention, stating that "whether for records of old work, designs of new work, draughtsmanship, or colouring, the R.I.B.A. prize drawings are well worth a visit," and inviting members to bring the exhibition to the notice of any students of architecture among their acquaintance, "as the standard of work will rise higher every year by means of such Exhibitions."

THERE have been more interesting exhibitions of the Society of Painter-Etchers, whose works are now to be seen in the gallery of the Society of Painters in Water-colours, forming the eleventh annual exhibition; but there is a great deal to look at, though including a good deal which does not properly come under the province of etching. The essential quality of etching is that it combines the permanence and the duplicating power of engraving with the freedom of hand of pen or pencil sketching. Etchers who neglect this freedom of hand and aim at the finish and comparative realism of a highly wrought engraving are simply parting with the essential characteristics of their art, and wasting time in elaborate work which might as well be done in engraving, and would print more easily, more forcibly, and in much greater number, from an engraved plate. Thus we can see no excuse for such etchings as Mr. Law's, which are merely like popular engravings worked up in a rather sensational manner, and in which there is more of labour and patience than art. The same of Mr. Sherborn's "Bookplates," which are admirable in design and execution, but might just as well be engraved. On the other hand, there is a point at which freedom degenerates into what we should call "scratchiness," a point reached by Mr. Percy Thomas and Mr. O. Hall in some of their small sketches, where lines seem to be scribbled about without definite meaning. In a perfect etching there should be freedom of line combined with definite intention in each line. The most typical works in this sense in the collection are the studies of heads by M. Helleu, mostly in dry-point, which are masterly in their indication of modelling by pure line, and some of the small carefully considered studies of scenes by Mr. Short, such as "The Solway at Mid-day" (49). The amount of effect indicated in this, without a single superfluous or uncertain line, is a good lesson. Among other works which are specially good from the line-etching point of view are those by Mr. Slocombe, or most of them; "The Matterhorn from the Riffelberg" (21) conveys no sense of the scale and distance of the mountain. M. Jacomb-Hood's "On a Paris Quay" (30), is an admirable little bit; his "Siren" (32), is too pictorial but has a certain sentiment, reminding one of Corot. Mr. Strang's motley collection contains some things very clever and some outrageously ugly and repulsive. Mr. H. R. Robertson's studies of heads are good; Miss Bolingbroke's dry-point "The Loom" (80), Mr. C. J. Watson's and Mr. Herbert Marshall's sketches of cities and streets, Colonel Goff's contributions, especially "The Métropôle, Brighton" (122), are among the things that should be looked at, also those by Mr. Cameron and Mr. Urwick, and the sea subjects by Herr Storm van Gravesande, who has a way of indicating the movement of the sea by thick ropy black lines, which is perhaps too defiantly free, but is in the true spirit of etching. Mr. Haig has a fine and highly finished interior of Durham Cathedral (204); this again, however, is rather engraving than true etching. There is a small collection of works by old masters, including a considerable number of Hollar's elaborately wrought drawings of shells, which are tolerably familiar objects now, but are always interesting.

LETTER FROM PARIS.

AFTER having acquitted the sculptor "Jacques France," as already mentioned, for an attempted assassination, the Assize Courts have now also acquitted the Spanish painter Jean Luna de San Pedro, who had murdered his wife and her mother in a paroxysm of jealousy. These untoward events have not unnaturally caused a considerable perturbation in the world of artists, whose peaceful studies have been twice disturbed by these unaccustomed deeds of violence.

Besides the exhibition of the Cercle Volney, to which we have already referred, about half-a-dozen small exhibitions are open, each of them with a certain interest. We may give precedence to the oldest, that of the "Aquarellistes," which has now had fifteen years of existence, but has suffered the loss of many of the most brilliant among the artists who originally founded it as a kind of imitation of the Society of Water-colour Artists of London. The society, however, is still numerous and flourishing, and the older members are among the foremost in the field. We find among them M. Harpignies with his bright river-side scenes and large spaces of sky. M. Paul Lecomte exhibits still his slight but bold sketches. M. Lhermitte is there with his simple but broad and grand charcoal studies, M. Boulet de Monvel with his scenes of child-life; MM. Clairin and Pujol illustrate Venice, and M. Jeanniot has gone for subjects to Zola's "Debâcle." The illustration of "Napoleon III. and his Staff," by a painter who was originally an officer, deserves special mention for its spirit and reality in the representation of types of French military life.

The "Cercle des Mirlitons" has transferred its quarters to the fine house in the Place de la Concorde, formerly occupied by the "Cercle Impérial," the garden of which extends to the entrance of the Champs Elysées. Thus transformed and enlarged, the club has dropped its former title for that of "L'Epatant," a nomenclature essentially Parisian, and which may be rendered into English as "most fashionable." Its annual exhibition, as usual, is one of the most important artistic events in the fashionable world. There are this year a great number of portraits, bearing the signatures of MM. Maignan, Courtois, Weertz, Benjamin Constant, and Carolus Duran. M. Gervex is conspicuous by a very remarkable study of a head of a young woman. Among other works we may mention especially the two fine landscapes by M. Cazin, "L'Eclaircie" and "Temps Calme." There are also some very fine landscapes by M. Pierre Lagarde.

What can one say of the exhibition of the "Femmes Peintres et Sculpteurs" at the Palais de l'Industrie? This attempt has been going on for twelve years, and nothing has come of it, and this year's exhibition is one of the weakest of the whole series, and certainly shows nothing whatever to justify the efforts which its president, Madame Léon Berteaux, has made to get the Institut and the École des Beaux-Arts open to female artists. A certain review, entitled *L'Art Français*, has been asking and publishing through its columns the opinions of various leading artists on the admission of women to State instruction in art. M. Puvis de Chavannes has declined to pronounce any opinion, while M. Bonnat, on the other hand, has plainly given his opinion that "women have something better to do than paint pictures." M. Henner says it is useless to propose to increase the number of pupils in schools that are already overcrowded. MM. Chartran, Dagnan-Bouveret, and Rodin are of the same opinion, and M. Carolus Duran alone has pronounced in favour of State teaching for women, provided it be in perfectly separate ateliers from those of the men. M. Dalou has a special view of his own, and declares with the rather blunt frankness which characterises him that he has no time to discuss the futile question of the admission of women into a school the very existence of which he considers as a "calamité artistique," and of which he only desires to see the total suppression.

Another small exhibition has been opened under the title (as already mentioned) of the "Société des Parisiens de Paris." As its name indicates, this new society is restricted to artists who are natives of Paris. From an artistic point of view it presents nothing very remarkable, and the origin of the painters has not conferred originality on their works. The only things in it worth remark are some portraits by M. Régamy, a pastel by M. H. Cain, flower-pieces by M. Cormon, a panel by M. Barrias, and a fine ivory statuette by the late M. Moreau-Vauthier.

We may also notice a small exhibition at the Georges Petit gallery by a group of painters who style themselves "Les Inquiets." Why this title it is difficult to understand, unless it is a modest indication that they are very diffident of criticism and consequently afraid of the judgment which may be passed upon an exhibition which in reality is an interesting one, and better than some others with more high-sounding titles.

To terminate this cycle of small exhibitions we may mention one more, which has been organised by a certain number of artists who excel in the representation of horses, and have got up a small exhibition of their works for the occasion of the forthcoming horse show at the Palais de l'Industrie. Among them we note the names of MM. Gerôme, Aimé, Morot Gavarni, Georges Busson, the Compte du Passage, and Froment Meurice.

To-morrow is the opening day at the much-talked-of Meissonier exhibition, when the entrance fee is to be 100 francs for each person, the proceeds to go to a charity. Eleven hundred pictures

have been collected in this exhibition, for which the Government has, as a very exceptional favour, granted the loan of the painter's few works which are in the Luxembourg, viz. :—"Solferino," "L'Homme à la Fenêtre," "Napoleon III. et Son État Major," and "Le Chant."

We have already alluded to the scheme for the exhibition of 1900 devised by M. Saint-Lane. Here is the outline of that submitted by M. Berlier, the engineer. He has selected the Bois de Vincennes as a site, where the available area will be about 1,400 acres. At the extremity of the exhibition, the principal entrance to which will be by the Lac Daumesnil, M. Berlier proposes to establish a temporary town with a dozen streets, hotels, a theatre, a circus, &c. The principal means of transport, besides the boats and the tramways, will be a railway connecting with the Ceinture line and with the existing line to Vincennes. M. Devie (architect) proposes on the other hand the plâteau of Courbevoie, on the prolongation of the Avenue de la Grande Armée. He proposes to occupy more than three million square mètres, the site being in the form of a fan spreading over the width of two kilomètres and with a radius of 1,000 mètres. At the extremity of each stick of the fan will be a palace, in the rear of which will be the special galleries of the exhibition. We may notice also the project of M. Gervais, who proposes as a site the large area of ground situated between the fortifications and the Commune d'Issy, at the south-west of Paris. Lastly, M. Mulette, also an architect and brother of the celebrated Egyptologist, proposes to establish the exhibition of 1900 on the outer zone of fortifications comprised between the Bois de Boulogne and the Avenue de St. Denis. However interesting the consideration of these different projects may be, we do not believe one of them has a chance of success, seeing that the Municipal Council, with all the authority derived from its financial participation with the scheme, is resolutely in favour of the Champ de Mars site, the area of which it is proposed should be nearly doubled by the addition of the whole of the Quartier du Grenelle situated alongside the Avenue Suffren. This is the conclusion embodied in the report of M. Alphonse de Humbert, which is shortly to come under discussion, and in which it is proposed to devote 40 million francs to the expense of compensation in securing that part of Paris as a portion of the site for the exhibition.

The monument to be erected to M. Thiers in his chapel in Père Lachaise is in active progress. The monument, designed by M. Mercié, is composed of three figures each three mètres in height. That of Thiers, standing with half-closed eyes, appears as if in profound thought; a female figure, symbolic of Immortality, offers him a crown, while another figure representing "La Patrie," is seated on a broken cannon; she holds in her right hand the staff of a standard, the folds of which, behind, partly cover the pedestal of the monument. She looks sadly at the crypt before her, in which is placed the sarcophagus of the deceased statesman. This figure and that of Thiers are in marble, the figure of Immortality is in bronze. An exterior view of the mortuary chapel, designed by M. Aldrophe, the architect, was published in the *Builder* about two years ago.

We have to record the premature death of a sculptor of talent, M. Louis Alexandre Lefèvre-Deslouchamps, who died at Paris on February 22, at the age of forty-three. Born at Cherbourg, he became a pupil of Dumont, and produced a certain number of works which were much admired, and most of which were exhibited at the Salon between the years 1873 and 1890. Among these were "Jeune fille se retirant une épine du pied;" "Marguerite à l'Eglise;" the marble group entitled "Premières Joies," which decorates the Hôtel de Ville of Havre; "À l'Abattoir," a marble group decorating the entry to the abattoirs of La Villette, to which the "Pâturage" of M. Albert Lefeuvre forms a pendant; "Muse Eplorée," intended for the tomb of Millet the painter, and which was purchased by the State from the Salon of 1890. He made also some fine portrait busts, among them those of the Comte de Chambord, Mdme. Henri Gréville, M. Andrieu, and Admiral Peyron. He also executed the sculptural decoration of the Theatre at Cherbourg.

We have also to record the death, at the age of seventy-three, of M. Léopold Gély, a distinguished artist in Sèvres ware, and who was the first to apply to porcelain the "pâtes colorées," discovered by the chemist, Robert. This process, then entirely novel, was applied for the first time on the pieces made for the London Exhibition of 1851, and formed the commencement of a complete change in the decorative treatment of Sèvres porcelain.

WHAT IS ARCHITECTURE, AND HOW CAN IT BE ADVANCED?*

BY PROFESSOR AITCHISON, A.R.A.

My last lecture was only a sketch of the beginning of Greek art, followed down through Roman, Byzantine, Romanesque, and Gothic days to the extinction of Gothic. This extinction was caused by a sudden awakening of the human mind in the West, and to a new standard of taste being offered to it. Though we have nothing to do with any philosophical considerations, it can, I think, do no harm to notice this, that Saracen architecture goes on still in India, and in parts of the far East, in the phases adopted by the Mogul conquerors. The merits of this Eastern architecture may or may not commend themselves to our taste, but this curious fact is patent, that English architects, having no living English or European style to work in, at once adopt the Eastern style they find. This, I think, is scarcely what we wish; I think all persons, architects included, would prefer that the Westerns should teach the Easterns how to build properly, than be taught by them; but, as it is, architects have to go to India, Siam, or Burmah to learn the æsthetic side of their profession; for we must, of course, learn from those who can teach.

I think some lessons may be learnt from what has been said in the last lecture. We see the art of building first absorbing all useful constructional inventions, then gradually converting them into æsthetic features, and producing in special buildings, mainly made up of these mechanical and æsthetic features, grand emotional results. The question we naturally ask ourselves is, why we cannot do the same? All events in which humanity is concerned consist of many factors; for instance, in this case, of natural capacity, strong desires, their direction by education which give aims to life, industry, opportunity, surroundings, and methods. We may, of course, put our capacity as below the Greeks, Romans, and Byzantines, below the savages who overran the West, or below that of the people of the Middle Ages; we may have feebler desires, and a worse education; we may lack opportunities, our surroundings may be unfavourable, or we may have no method, or only a bad one. It would lead us much too far-a-field to attempt to make all these comparisons, and on some of these points we know, and I fear can know, but little; yet I think most people would say we had excellent capacities, good education, were very industrious, had splendid opportunities, and excellent surroundings, though I do not take that view in regard to our opportunities and surroundings; let us then look at the method.

The Romanesque method was to give some general instruction, then to teach the technical arts and sciences that underlie most of the trades connected with building, and then to take the students who showed aptitude into the school for architects. We may be sure that there they studied the last successful building of the school, and tried to surpass the best one of a rival establishment; and when they were advanced enough, they were sent to the churches, abbeys, or monasteries, then being built by the mother abbey, to see the designs of their school carried out. When buildings fell into the hands of lay architects, the first guild must, in all probability, have been composed of pupils of the abbey schools. You may be sure, too, that there was keen competition between the various religious corporations, to have their churches made the best and most taking, of those they had seen; which particularly applied to those near them: and there was also a keen desire on the part of the communes to have their cathedrals bigger, handsomer, and more impressive than the abbey churches. The churches and cathedrals themselves were mainly built for emotional effects, and the Christianity of the day was, for all practical purposes, believed to be the true religion; though this unanimity was greatly brought about by the burning of heretics. This teaching of architecture had lasted from the fourth to the beginning of the thirteenth century.

We cannot adopt this method of teaching, for we have no schools; but even if we had, they would not be schools for designing buildings for the proprietors. Even if we let our fancy run away with us so far, as to imagine a building company beginning by starting a school for architects, the ends in view would be different, for the company would certainly not confine its buildings to barracks and churches for single men devoted to asceticism, whose only object was to get to heaven themselves and to teach others how to get there too; nor would such a company have the perfection of teaching that centuries of experience had given. I never heard of there being any heresy or schism, of an architectural sort, in these monastic schools, but if any such symptoms showed themselves, a very strong discipline would have been applied. I doubt if any Act of Parliament in our day, would allow a company to tie up and well flog with a cat-o'-nine-tails, the pupils who tried to introduce elements foreign to the traditions of the school. The abbey school, too, did not only teach architecture, but every art connected with building, as well as the sumptuary and some of the fine arts. Masons, carpenters, joiners, plumbers, slaters, smiths, and glaziers were taught there; as well as cabinet-makers, braziers, glass-painters, silver and gold smiths, jewellers, perfumers, scribes, illuminators, and bookbinders: and also painters sculptors, singers, and musicians,—so that whatever principles of design were taught in the schools, were taught to the whole body of workers affected by them.

If we allow ourselves to imagine Phidias and Ictinus living in those days, and being forced, through distress, to enter the schools, Phidias would have been told by the master or the abbot, that naked ruffians were not fit for Christian churches, and that the heads of his statues had no character; while the architectural master would have told Ictinus that he was ignorant of the first principles of construction, and that his forms were childish and without expression.

I am afraid we must look forward to the entire liberty of the subject in matters of architecture, provided always that the practitioner does not injure anyone else, either in his person or material interests; the injury bad architecture inflicts on society, can only be punished by scorn and contempt. We can only hope that when each architect has taught himself what he ought to know, that the Classic, Romanesque, Saracenic, Gothic, Indian, and half-dozen Renaissance schools may, between them, finally evolve a product that may captivate the people of the day. Architects admit that certain buildings evoke certain emotions in them; some of these buildings we call ugly, some frowning, some beautiful, some graceful, some masculine, some robust, and some sublime. I am afraid I can only aid students thus far, by saying that when any architectural monument raises an emotion in them, they must analyse that emotion, so as to be sure that they recognise the real one that the building evokes; then see if it be the one the building should excite; and then try and make out why and how this has been caused. To ascertain the cause, they must measure the height and width of the building, measure and draw the shapes of the parts and their position, see what effect the colour of the whole and the parts have, and what are the effects of the sculpture, of the painting, and of the lighting. Those who do this will then have a tolerably exact notion of why the building has so affected them. It would be better still if they could make exhaustive experiments, but I fear these would be too costly for any one, for absolute size has a great effect.

There was a narrow alley in the City, between the walls of two lofty warehouses, and the going down this alley always affected me with a certain awe, when I looked up and saw the narrow strip of sky between those lofty walls, the view excited in me a feeling of sublimity. I was more strongly affected on the night I first alighted at Bologna, and passed between the two tall leaning towers, the Asinelli and Garisenda; the latter seemed, like Jack's bean-stalk, to reach the moon. Neither tower has any particular merit in daylight except its height; but this bare height strikes every one, and has been immortalised by Dante.

Elegant proportions are absolutely necessary if beauty be the main object of the building, and I think a contrast between solidity and lightness greatly adds to the effect; but the lightness should not suggest instability. Giotto's bell-tower at Florence is a lovely example, though it would have been better, had he not made the columns corkscrews. Genius and great skill are, however, so rare that we should be thankful for their masterpieces, even when they are not quite perfect. At the same time, when we study anything to learn principles, we should not allow our admiration to run away with our sense, but admit that Homer sometimes nods.

The gateway at Perugia is another instance of

* Being the fifth Royal Academy Lecture on Architecture this Session. Delivered on Monday evening, Feb. 6.

the happy effect of contrast; the gateway itself is massive, and, looking at it from the outside, the walls beyond it to the left project, and rise in one steep slope to form a bastion; on the top of this is an arcaded building, and the group is both striking and graceful, for the light arcading on the bastion acts as a foil to the size and massive dignity of the Roman gate.

I think the most divinely beautiful thing that I have seen is the little caryatid temple on the flank of the Erechtheum; possibly the monument of Lysicrates would be so too, if one's imagination were vivid enough to fill up all the gaps that "time, war, flood, and fire" have made in it. One hardly claims the Parthenon and the Propylæum as belonging to this class, as elements of sublimity carry the mind to loftier altitudes. In almost every other work but Greek, you make allowances for some feebleness, incompleteness, or false note, but in the perfect work of the Athenians you feel that nothing can be added and nothing taken away. Fine Greek works are as superior in quality to all others, as Raffaelle's pictures are in form and composition, Titian's in colour, and Milton's poems in nobility of thought and perfection of grace and workmanship. These poems are what has been called "a sculpturing of the imagination." Perhaps for a whole building of modern days, Bramante's Cancelleria at Rome is the most perfect, the Palazzo Vendramin at Venice the most stately, and the Palazzo Spinelli the most delightful. The arcade at the end of the Court of the Fishpond at the Alhambra is a most lovely piece of work, but no comparison can be made between Saracenic and Athenian art,—in fact these two arts cannot be spoken of in the same breath. The nearest approach to Greek work was that of the Italian Quattrocentisti. Some of the tombs in the Badia at Florence and elsewhere are exquisite, like the sarcophagus on the circle in the Frari at Venice.

To speak only of the later great English architects, Wilkins had caught something of the graceful majesty of Greece, as may be seen at University College, London; some of Soane's buildings have great merits; Sir Charles Barry was most admirable in his proportions, and his clock tower at the Houses of Parliament is a masterly design; and there was a distinct and graceful individuality about all Prof. Cockerell's work that showed a refined and dignified mind, and he had, besides his architectural gifts, the genius of a sculptor.

To obtain sublimity, disproportion is mostly adopted, exaggerated height or exaggerated width, and sometimes a look of exaggerated strength; I have never observed that length, however excessive, produces a feeling of sublimity. The look of exaggerated strength is seen in the piers of Durham and Seville cathedrals, and in those of the Town Hall at Brescia; and exaggerated height as compared with width is shown in many cathedrals. Amiens is said to be but 46 ft. wide and 140 ft. high, while Beauvais is said to be but 45 ft. wide and 153 ft. high, and both are examples of sublimity in height. It is not surprising that Sta. Sophia looks so sublimely vast, if we consider that its nave is about 105 ft. wide, while, with the exception of St. Peter's, which is about 80 ft., the naves of most cathedrals do not exceed 65 ft. The nave of Sta. Sophia is 227 ft. long without the apse, and its height to the apex of the dome 182 ft.; besides, the shapes of its parts are both novel and fine, and its treatment as a whole is original. The vastest looking building for mere area is the Mosque of Abd-el-Rahman at Cordova; the innumerable columns, as you go down one of the central aisles, give diagonal vistas, and from the distance, the walls are not seen. To get scale is one of the means of showing sublimity in things that are immense, whether that immensity be in bulk, width, or loftiness. And when the opening, which is usually the means of giving scale to vast walls, is exactly of the right shape and size, and in the right place, it makes a more effective composition with a plain wall, than the greatest elaboration or ornament, if the opening is of the wrong size or in the wrong place. I do not know the size of the wall of the theatre at Orange, but it looks stupendous—the great Pyramid could not have looked so vast, if seen from the top, when it was cased with smooth stone, as it does now, when you see the courses widening continually beneath your eye. And the seats in the Flavian amphitheatre have the same effect.

Towers and spires had a great charm for the Mediævals; some see in them one of the most popular signs of worship. Doubtless there is a sublimity about those that are well-designed and are very lofty; they are, too, wondrous instances of the skill and perseverance of so diminutive a creature as man. As a means of safety and defence they had their use in military works. From the tops of towers a hostile force could be seen at a long distance, and things hurled from them must have had a destructive force almost equal to that of artillery. After the communes were established in Italy, a bell-tower was the sign of a free town, and the bell was rung to call the citizens to arms, either for manning the walls or for quelling a riot; and they were equally loved in France and England. Many cathedrals were designed to have a group; Laon had seven. The first towers in ecclesiastical buildings were mainly the upward prolongation of lanterns to light the altar when it was put at the junction of the nave and transept; and from this practice central towers are said to have arisen. The Baptistery of St. George of Ezra, said to be as early as the sixth century, had a tall, egg-shaped dome. A steeple put in the centre of a cathedral is a bad position for it, as the steeple dwarfs the building and the building dwarfs the steeple. The wooden spire at Amiens, though taller than the steeple of Salisbury, looks insignificant.

For effect there is nothing like the square towers of Italy, springing straight out of the ground, and carried up sheer, with a graceful top like Giotto's, and the one in front of St. Mark's; there are others attached to buildings which are very graceful, such as those at the town halls of Verona and Siena. Most of the minarets of the Moslems are graceful and well designed, and show the good effects produced by a judicious change of form from square to round, through octagons and haxagons, they are also admirably divided horizontally by projecting balconies on stalactites. I may mention those at the Mosques of El Azhar, Barkūk, of El-Bordeyny, of Sultan Hasan, of El Ghory, of Kait Bey, and others among the tombs of the Mameluke Sultans, though I have been able to trace to the Saracens but little of Gothic architecture, except the cusping; and this, I believe, was taken by the Saracens from India; the whole cusp, though with the two half cusps, are said to have been taken from the form of Persian sepulchres. This form is at least found in Cashmire, in buildings said to date from 600 B.C. There are at Cairo both Norman ornaments and motives, and one piece of absolute Gothic in the Maristan of Kaloun, of which I think we may safely say that it was designed by a Mediæval architect; but whether that architect was borrowed from Europe, or was a prisoner, I cannot say. The Norman work has probably the same origin, but such is our archæological ignorance, that it cannot with certainty be affirmed that the features and ornaments common to Normans and Saracens, were not copied by each from an independent source. I think that there can be no doubt that the Saracen passion for geometry, and their knowledge of it, was communicated to the Christians of the West. I think, too, that the form Gothic took was greatly due to Saracen influence, that is to say, that the Western Christians saw and admired the Moslem architecture, and endeavoured to equal or surpass it by different means. There are geometrical patterns in Saracen Egypt, that might be Gothic ones, and the Christians undoubtedly appreciated the marvellous effect got by the ingenious repetition of comparatively simple forms, and applied this discovery in their own way.

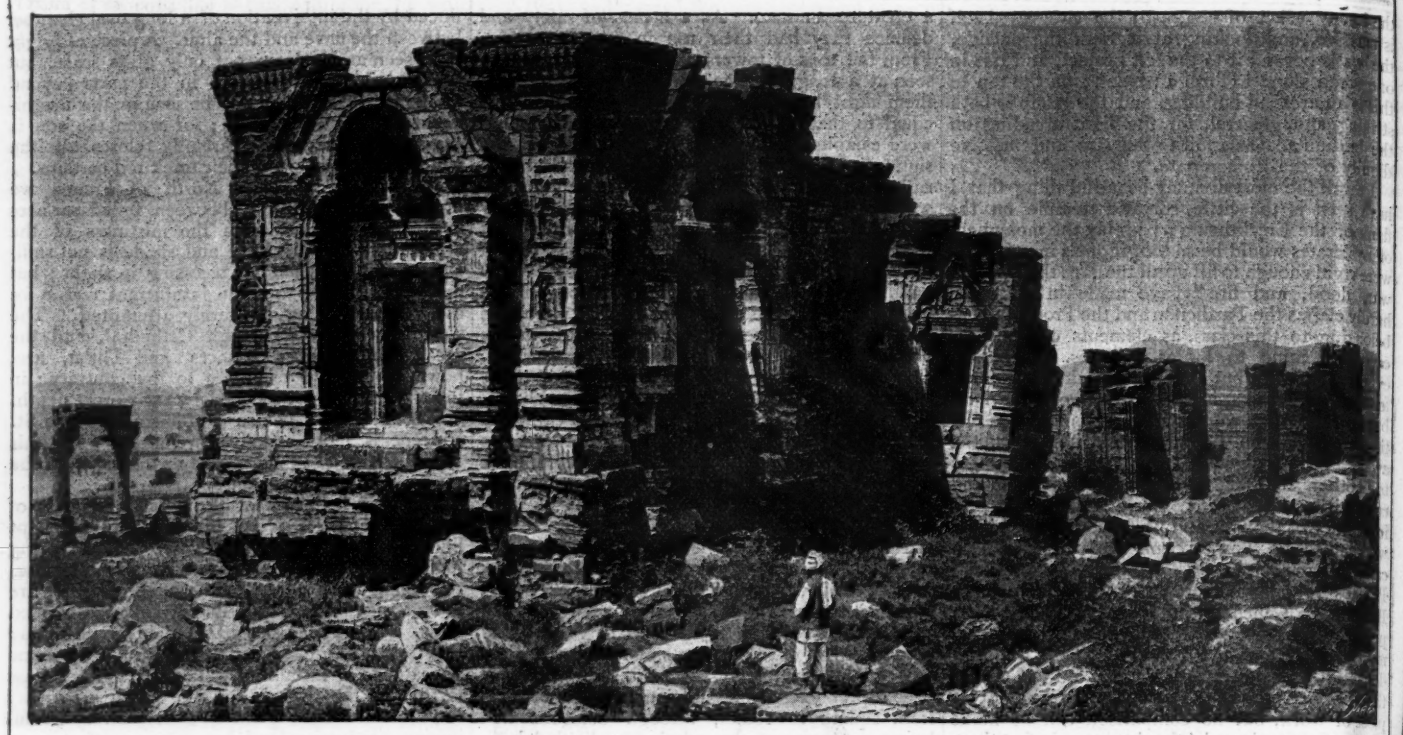
In one of my former lectures I said that some of the most striking effects are to be got by the lighting, when a building is to be used for emotional purposes; for when it is for ordinary use, a sufficiency of light is wanted for the purposes of life. Supposing Dr. Dörpfeld's theory of the lighting of the Greek temples turns out to be true, we can scarcely imagine a more impressive effect, than when the horizontal rays of the rising sun lit up the statue of the deity, which blazed out on a back-ground of gloom; and the gold and ivory of the statue must have added greatly to the magnificence of the spectacle. I think we must allow that painters are not only the best judges of effect, but search out for it with more care than ordinary persons. On the north side of the choir of St. Mark's there is a little chapel lit by one very small window; under this window is a seat, whence you get a glimpse of the bright light of the transept, against which the ikonostasis with its figures stands out dark on the sunlit ground; while all the shade is enriched with reflected and coloured light, from the mosaic of the ceiling, and from the rich marbles of the walls and floor. This chapel is a favourite subject for artists to paint. Another charming effect is to look from light through comparative gloom to brightness. An admirable example of this is found in Sta. Maria della Salute at Venice, and is produced by the intervention of a long oval chamber between the nave and the altar. A piece of bright light seen amid gloom not only gives scale, but suggests size and grandeur in the parts beyond the light. This effect may be seen in the magnificent Cathedral of Seville; for when the sun is shining the sacristan carefully closes all the windows but one, with their thick red curtains.

In England and the North of France we mostly lose the contrast between broad surfaces and deep recesses, from the mistiness of the atmosphere, for the light and shade is not sufficiently marked when the recessing is slight; but this seems to me to be an insufficient reason for the contrast being so rarely attempted. The west front of Peterborough Cathedral, and the great porches at Coutances and Dijon, are, however, effective examples to the contrary; in the two latter it is produced by their great depth. The front of the palace at Blois next Place St. Vincent is most effective in sunshine, but this effect is gained at the expense of the light of the rooms, which are very dark.

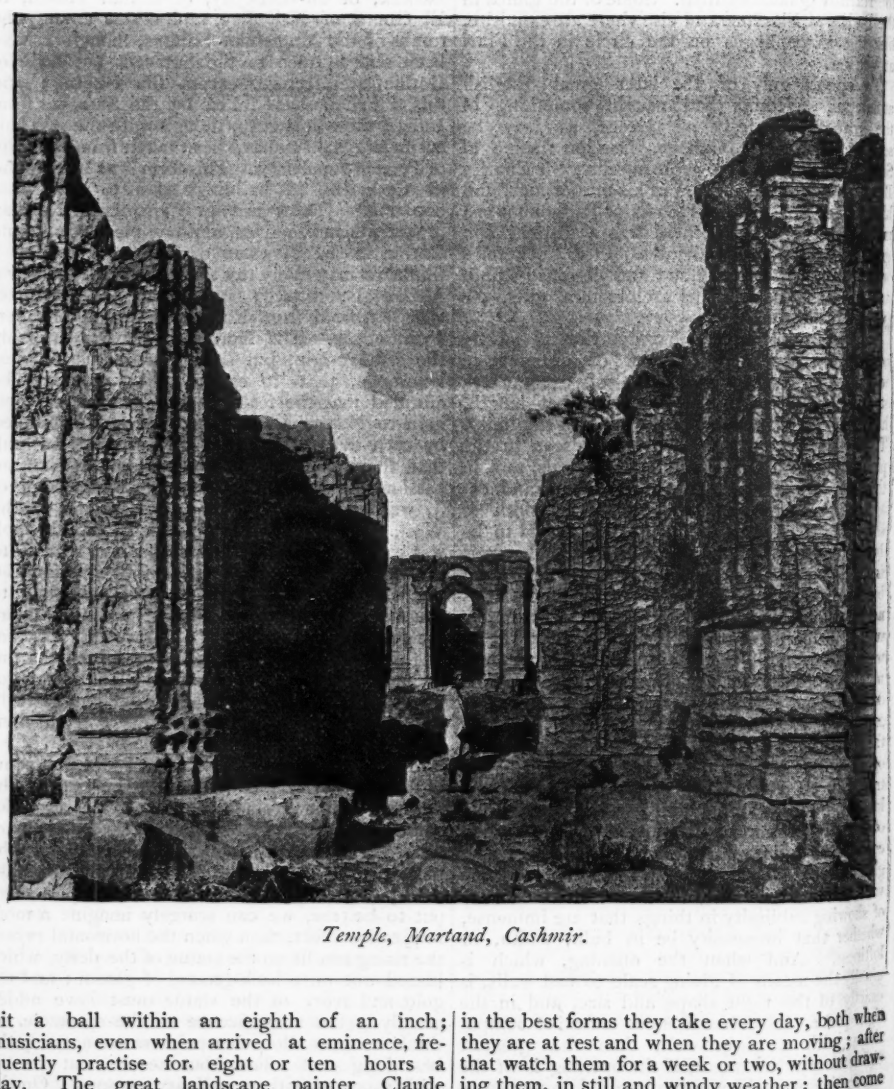
I cannot believe that the great cathedrals of the Middle Ages were intended to be kept light, as they now mostly are, thus giving them the monotonous effect we all deplore. At Rheims the whole of the upper windows are full of magnificent and deeply-coloured stained glass, while the aisles have plain white glass; this reverses the proper effect, and gives some appearance of instability. The best stained glass is that of the twelfth and thirteenth centuries; for the later light glass is merely a very skilful human production, and has no more effect on us than the tapestries that hang on the piers or under the windows; only the figures and buildings in the tapestries have at least the merit of solidity. The grand glass of Chartres and Rheims comes upon us as a new revelation, and we think these windows must have had angels for designers. In the best windows no subjects are to be made out, but there is a divine and palpitating melody of colour in them; they look as if the jewels of heaven's pavement had been melted into flame, to give mortals some glimpses of heavenly glory; so that men might strive and suffer, to inherit such ineffable bliss. You come away from these cathedrals thinking that all the arts are but "as dust in the balance" compared with the glazier's. These cathedrals, the wondrous monuments of man's power over matter, and of his skill and science that have enshrined the labours of thousands for long years, seem but unworthy frames for this divine glass that wraps us into ecstasies and brings all heaven before our eyes. Divine beauty is not to be weighed or measured against mere mortal achievements. An Indian story prettily illustrates this:—

"One of the ancient Buddhas before Sakya-Mouni (our Buddha) reached the Nirvana in a strange way. One day he saw a falcon pursuing a little bird. 'I beg you,' said he to the bird of prey, 'to leave that pretty creature, and I will give you its weight of my flesh.' A pair of scales at once came down from heaven, and the settling of the bargain began. The little bird comfortably nestled into one of the scale-pans; in the other the saint put a large slice of his flesh: the scale-beam never budged; strip by strip his whole body passed into it; the scale did not yet move. At the moment the last morsel of the body of the holy man was put into the scale the pan with the little bird kicked the beam, the little bird flew away, and the saint entered into Nirvana."

To sum up all that has been said, you can arrange each room or division of your building so as to afford the exact accommodation wanted, and so as to allow the people to group themselves as the nature of their occupation will force or incline them. You can properly light the room according to the wants of the occupants, and ventilate each room also according to its wants; you can arrange the whole of them together into the most convenient group, which may often put you to shifts for the lighting, and you may at least see how former architects managed under similar exigencies. You can learn the qualities and powers of the materials you are obliged to use, you can arrange all the structural parts in strict accordance with the weights to be carried and with the laws of statics. You will thus get a proper carcase, with all the characteristics that the shapes give and the construction requires, and if you could follow this out completely, as nature can do, you would have the building complete both for utility and character; but at present the solution will only be in the rough, and you next have to consider how you can arbitrarily add to it, so as to obtain the right expression for its purpose, by æsthetic devices. Let us



Temple, Martand, Cashmir.



Temple, Martand, Cashmir.

Suppose the student to have completed his studies so as to know how any or every one of the people, from the Greeks downward, have got over the difficulties of gracefully bringing one form into another, of accentuating parts, of drawing attention to one part more than to another, of dividing surfaces agreeably, and lighting the building properly, and that he has roughly found out what mouldings should be used; and has also learned that which is the crowning knowledge of the architect, how things will look in the positions in which they are to be put. Directly he has a building to design it will be marked by his personal proclivities; supposing him to be a great man, his building will, in the eyes of other architects, be a success, and they will try and improve on his work, and as soon as the whole profession is embarked on this scheme of improvement, there will be a much greater chance of nearing perfection. When such a one gets a building mainly for delight, he will no doubt enlist the sculptor and the painter to enrich certain parts with ornament and colour, but if the building appeal to some high motive in mankind, he will want the sculptor and the painter to make it speak more distinctly, by showing examples of men who are doing, or have done, such great acts.

To show how some advance may be made in simple matters, I may say that we are always wanting mouldings for division or accentuation. Let us suppose our student has a large garden to his house, and puts up groups of Greek mouldings in plaster, and contemplates these mouldings every day for a year, at sunrise, mid-day, and sunset, and twice between, and notes how they look at these times. He will then find that, although these Greek mouldings may look admirable on a few clear sunshiny days in summer, they will have no effect at all the greater part of the year; he will not want to sacrifice the appearance of his building for three-quarters of the year; so he will get some clay, and see how he can make these mouldings tell for the three-quarters of the year that are dull or misty. He will find that he must deeply undercut the mouldings for shadow, and exaggerate the curves that are to tell bright, he will at last find out how to make mouldings that will tell what he wants in England, particularly if he does not neglect the hints he may get from Gothic mouldings. If he be a genius, he will thus form a school for mouldings. To take all this trouble, may possibly appear Utopian to many students, but it is what the Greek architects must have done; they could not have succeeded in perfecting their mouldings in the way they did, without constant observation and striving, and I beg you to observe that such laborious study is by no means unknown in the fine arts; I might say in arts that are not fine. Roberts, the billiard player, said if he left off practice for six weeks he could not hit a ball within an eighth of an inch; musicians, even when arrived at eminence, frequently practise for eight or ten hours a day. The great landscape painter Claude is said to have inhabited an isolated tower for two years, and during that time to have made studies of the clouds every hour from sunrise to sunset, and he too was a genius! I once inlaid a chimney-piece with a representation of some reeds in the flat. I had got some reeds, studied and drawn them, and composed the pattern; I asked a friend who was a painter what he thought of the inlay. He said "It is pretty bad." I asked how I could improve it. He said: "Take a lodging for a few months near the banks of a stream where reeds grow. First pull up a few reeds and draw them properly, then draw them growing in the best forms they take every day, both when they are at rest and when they are moving; after that watch them for a week or two, without drawing them, in still and windy weather; then come back and design your inlay. You will have got a fair idea of the form and behaviour of reeds, and will do something better."

All that can be taught is the method, mechanism, or what you like to call it, of the art; you cannot give originality or genius, but you can teach, so that when the genius comes he has his tools ready for the work. We are apt to think that in work where there is no handicraft: that the skill is inspiration; but this is not so; the orator, playwright, or poet has to learn his art as well as to have his inspiration. As Ben Jonson said, it is true that "the poet i

Temple in a Tank at Pandretan, on the Jhelum, about five miles above nearest bridge in Srinagar, Cashmir (nearly 1.000 years old).

born and not made," still there is a good deal of making in a poet.

Written words give neither the tone of the voice, the expression of the face, nor the surroundings of the scene, and perhaps do not always meet with the proper vein in the reader. If we want to write a good style, we usually paraphrase some of the best authors; and, if we propose to tell a pathetic story, or to raise a laugh, especially in writing, it would be necessary for us to see how the masters of pathos or humour managed their words, so as to produce tears or laughter in their readers or hearers. Tennyson lets us into one of his secrets as a poet; that he was a student of the mechanism of his art. In his "Dream of Fair Women," he tells us of his reading at night the "Legend of Good Women" by Chaucer, and then he says:—

> "And, for a while, *the knowledge of his art*
> *Held me above the subject*, as strong gales
> Hold swollen clouds from raining, tho' my heart,
> Brimful of those wild tales,
> Charged both mine eyes with tears."

So I think you will see that it is necessary to study the mechanism of architecture, to learn how beauty, sublimity, or any of the emotions are produced.

We may think that it is not a time when much original conception in our art is likely to be forthcoming, on account of many circumstances that tend to repress it, and also to turn any natural aptitude into a different direction. But we must recollect that, though the present age seems unlikely to afford matter for poetical inspiration, we have had several distinguished poets, of whom, perhaps, Tennyson was the greatest. It is true that these poets had the command of past times as well as of the present, and could therefore draw on incidents that occurred in more stirring times, and amongst people with more violent desires, and at a time too when outward expression was less restrained; while architects only deal with the present: but still they found some of their poetical motives in contemporary life. They were to us like the lapidary, who knows the pebbles we tread on to be gems, which we do not recognise till he has cut and polished them.

Though architects are mostly employed on unemotional subjects, there are some opportunities of exercising their art on semi-poetical subjects. Houses are of the mixed sort; and when they are built for the owner himself to live in, it is always possible to adorn with propriety, those parts devoted to the exercise of the higher sentiments. In some cases, if the owner were encouraged, he would have some of the achievements of his ancestors, or a stirring event connected with himself or his family, sculptured on the front of his house, by one of our best sculptors. We still have churches, but they do not hold the position that they held in the Middle Ages. And besides this, the Protestant Church may be said to be destitute of ritual; its scheme is to affect the worshippers wholly by intellectual means, for with the exception of the architecture and some music, nothing that appeals to the emotions is allowed to be represented. Cathedrals are an impossibility, except as imitations of the Romish ones, as the clergy do not seem to know to what purpose they are to be devoted, and still less how the worshippers, who ought to fill the vast empty space of the nave and transept, are to be affected.

The largest important buildings that architects are now called upon to design are town halls; these are very different from those of the communes of the Middle Ages. Then they were a sort of Parliament House on a small scale; the councils that met in them did for the towns and their dependencies what Parliaments now do for their realms; peace and war were in their hands, as well as the punishment of malefactors, the fettering or unfettering of trade and manufactures, taxation, honours, and rewards. But our town halls are only a collection of offices, sometimes with a law court attached, and almost always with a music-hall. Now, although we may grumble about our water-rates, gas-bills, scavengering, and paving; they are not subjects that excite in us very lofty sentiments or high enthusiasm: so these buildings cannot with propriety be made as dignified or beautiful as the ancient town halls.

Religion must, I think, always exist, and must move mankind more deeply than any other subject, for though portions of it merely satisfy our curiosity, such as the creation of the Universe, and the reason of man's existence, the ills of life, over which he has no control, move him most deeply, and he not only wants consolation under these afflictions, but some sort of compensation for their injustice. The doctrine of the Stoics would not be very consolatory to us; their axiom that pain is no evil, does not commend itself to us as a truth, and though we admire their fortitude, their aim at rendering the will superior to misfortune must, if they ever attained it, have given them an overweening pride; so that the consolation they derived from their creed more resembled that which Milton's Satan proposed to himself, than that which most of us would desire.

There are many buildings that are worthy to have great efforts made, to give them their proper and high character; but none of them are so intimately bound up with our hopes and fears as the Church. The next thing that most nearly moves us all, is the well-being of our country; but a House of Parliament is only likely to be wanted once in several hundred years. Besides the want of great opportunities, there are many hindrances to a noble architecture. Perhaps the greatest, beyond the wants of a worthy object, is the absence of a succession of nearly similar buildings all over the country for objects that mankind are deeply interested in. We want buildings requiring the highest skill and daring in construction, of vast size, and to raise strong emotions in us; thus calling for the greatest intellectual and æsthetic skill, and such that require the type that is first chosen to be continued, with all the improvements that time and experience can give. The only building I can think of that would combine most of these conditions is a Temple to Mammon: here there would be no want of worshippers, nor would there be a town in the United Kingdom that did not require one; particularly if Mammon were believed to favour his worshippers. Think of the enormous crowd of gamblers on the Stock Exchange, on the Turf, and at the gaming table, who would add to the number of the faithful; and would contribute their gifts to the wealth of the Temple. Chapels would be erected all round the central temple to those whom Mammon had most favoured, with a master chapel to Midas; while Midas might have his chapel of chiselled gold; covered, roof, pavement, and all, with enamels and the most costly gems, if he would but bestow on his most fervent worshippers one hour of his power of turning everything he touched into gold. We are struck with the richness, costliness, and splendour of some of the chapels of the Byzantine Emperors, where the floors were of chased and enamelled silver, and the walls enriched with plates of jewelled gold; but these would fall into complete insignificance as compared with Midas's Chapel, whose golden casements, storied in colour, would be made of cut jewels, exceeding those we are ravished with in the Arabian Nights. This scheme, however, might not meet with general acceptance; and then the question is, "What class of building is to take the place of the old temple?" For unless the building is to aim at strong emotional effect, and to be repeated in all the large centres of the country; how is it possible that we can hope to rival the temples of antiquity or the churches of the Middle Ages?

TEMPLES AT MARTAND AND PANDRETAN, INDIA.

THESE temples were incidently referred to in Professor Aitchison's Fourth Royal Academy Lecture (page 148 *ante*) as showing the employment of cusped openings at an early period, and are, in other respects, interesting architectural remains. The remains at Martand Professor Aitchison puts as probably before the Christian era.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

TERRA-COTTA AND ITS TREATMENT.

THE ninth general meeting of this Institute for session 1892-93 was held on Monday evening last, at No. 9, Conduit-street, Regent-street, the President, Mr. J. Macvicar Anderson, in the chair.

The minutes of the previous meeting having been confirmed,

The Secretary, Mr. W. H. White, said he had to announce with regret the death of Mr. W. A. Boulnois, Fellow, of Waterloo-place, London. He was elected an Associate of the Institute in 1848 and a Fellow in 1859. He had also to announce the death of Mr. J. M. Cory, Fellow, of Shanghai, who was elected an Associate in 1880 and a Fellow in 1886.

The President said that happily they had no business that need detain them from at once listening to the papers which had been prepared for their edification,—papers devoted to a very interesting subject, which could not fail to interest all architects. He, therefore, without

further preface, would call upon Mr. Ingress Bell to read his paper on Terra-cotta. Mr. Bell's paper would be followed by one from Mr. S. H. Leech, and finally Mr. Leonard Stokes would read a paper on the subject.

Mr. E. Ingress Bell said he should endeavour to present the case for the employment of terra-cotta. He was disposed to advocate the use of that material on these broad, general grounds: that as it was, notwithstanding a few ancient examples and some recent experiments, practically a new material in our hands, we might reasonably hope that its careful and intelligent treatment might lead to new developments in architectural design. Architects in all ages of the world had addressed themselves to the solution of architectural problems by the aid of brick, stone, and marble, and so successful had they been in relating design to material that their more perfect works were accepted as standards of excellence to which we might conform, but which we could not hope to surpass. They seemed to have anticipated every combination of appropriate and agreeable form, and to have exhausted every source of artistic effect. So long as we worked with the materials with which they worked, we had no option but to follow in the same path: the problems of to-day were substantially those of old; the needs being the same and the materials the same the treatment was perforce similar. We needed the stimulus of change in architectural as in other matters, and relief from the stereotyped and too familiar forms. In what direction should that relief be sought? The elementary forms in architectural composition were scarcely susceptible of any material alteration; opportunities for variation must be left to the detail. It was detail in the main which supplied expression in architecture, and detail was excellent in the degree in which it conformed to the qualities of the materials employed. Did the peculiar properties of terra-cotta, suitably treated, promise new varieties of detail, new possibilities of architectural expression? He hoped in the end to elicit an affirmative reply. He would, first of all, clear the ground by touching upon one or two objections to the use of terra-cotta. It was sometimes urged in disparagement of terra-cotta that it was a cast material. It might be or it might not; but suppose it was? There was a time when such a charge would have been conclusive, but even cast iron was coming again into repute. Then if cast iron, why not cast clay, provided always that the design was suited to the material? We had gone on for a long time producing, by patient human labour, miles of dentils, and dog-teeth, and ball-flower ornament, each item the exact counterpart of its neighbour, and the practice had been generally approved, or at worst condoned. If the result was commendable, where was the evil of obtaining it by a short cut? The position taken up by a certain school, with whom he was in more or less sympathy, that each item should be differentiated by healthy human labour, within certain limits free, was an intelligible one; the practice of setting human labour, healthy or otherwise, but certainly not free, to produce multitudes of ornamental features, all exactly alike, had immemorial sanction. But the contention of those who allowed the identity and objected to the cast was difficult to appreciate. The use of terra-cotta was by no means limited to cast work. Mouldings could be run as plasterers' mouldings were, and with equal freedom; and the clay could be moulded into any form that the artist might dictate, or all three could be combined, or the field or background might be cast. The moulded lines, and the general features of the work might be run, and the artist's hand might easily and swiftly elaborate and embellish the forms thus mechanically supplied. Another objection to the use of terra-cotta was that the clay shrank and warped in the kiln, and the work was consequently untrue. That fact simply pointed to the abstention from the use of those traditional types which depended for their effect upon refinement and subtlety of line and contour. There were other and more picturesque forms of art where that peculiarity of material was even helpful, and went far to mitigate the hardness inseparable from work in which casting played a part. The lines had a free sketchy look, as though put in by hand, and the surfaces, not lying in one absolute perfect plane, diversified agreeably the general effect of light and shade. A more formidable charge against terra-cotta was that it did not "weather"; in other words, that it did not encourage that lichenous growth which was so grateful when seen on brick and stone. But the charge was not wholly true. In course of time terra-cotta did take some natural tinting, but it assumed this parti-coloured vesture very slowly. The question was mainly one of texture. Texture on terra-cotta varied almost from that of stone to that of porcelain. Even stone buildings in town did not "weather" in the above sense, and town buildings were, of course, much more numerous than country ones. The atmosphere of our towns, he would not say Nature, finished our work in black and white, without any regard to shape or form; one half of a vertical column being sometimes white, and the other half black. That brought them to the practical question—Should the façades of our buildings be daubed over with soot and water under pretence of "weathering," or should they be composed of a material which every shower would cleanse? An objection to the use of terra-cotta was that the too facile production of ornamental features might lead to their indiscriminate use, and that we might suffer from a plethora of poor ornament. But he was advocating the "careful and intelligent" use of terra-cotta. How, then, could they best develop the special attributes of terra-cotta for the purpose of architectural design? First of all, it was necessary for them to divest their minds of the habit of thinking in stone. They must not look upon terra-cotta as a sort of artificial stone, affording the means of doing easily and cheaply in one material what was done with difficulty and cost in another. The two materials demanded entirely different treatment. If they looked into the sources of expression in ancient and Mediæval art, they would see one characteristic pervading the whole: the labour was applied in the most rational and least wasteful manner consistent with the qualities of the material. The roughly squared block was reduced to planes below which the mouldings were sunk. Sometimes the basis was rectangular; sometimes it was a broad splay. In all, the light and shade were obtained by deepening down from the surface, hollow being added to moulding, and moulding to hollow, until the desired richness of effect was produced. Elaborate and complex work was of necessity costly, and work which could not be costly must be plain. One invariable universal system of *intaglio* governed all architectural expression in the past. The first thing which an architect, dealing with terra-cotta, realised was that the above methods were inapplicable, and the above restrictions were almost entirely removed; in fact, the architect was practically free from what the surveyors called "labours." The clay did not reach the workmen in square blocks, but in amorphous lumps, and would readily take any desired form, and one form as easily as another. Stone and marble, on the other hand, were costly to win and to transport. They were more or less refractory under the chisel, and they could not be elaborated beyond a certain point without impairing their durability. But with the tempered clay,—the good-tempered clay,—all that was changed; it was easy to manipulate, the surplus could be re-used, so that there was no waste, and it made little difference in point of cost whether a designer confined himself to the simple chamfer, or indulged in series upon series of mouldings. There was no limit to the delicacy and complexity of detail attainable; and it could, in theory at least, —and practice was fast overtaking theory,—be hardened by fire to imperishability. In colour there was a wide range, from leaden grey, through dull reds, and golden brown to buff. How could these seveval qualities be turned best to account? It was impossible to forecast the direction which the study of terra-cotta as a medium of architectural expression would ultimately take. The yielding clay was open to receive the impression of many minds. It might be that some development of Romanesque—a style which the American architects had found elastic enough to cover many modern requirements—would provide the most suitable basis, or it might be that the free and picturesque handling of our early Renaissance, before it quite broke with the Gothic spirit, would supply the desired *motif*. In any case, the limited size of the blocks procurable seemed to point to some style in harmony with our native art, which was essentially an architecture of small pieces. Was it too much to hope for the resuscitation and evolution of our native and indigenous architecture, from the point in its career which gave the first hint of its decadence—when the first importation of a foreign influence checked, convulsed, and then destroyed it? That period coincided with the reign of Henry VII. The art of that period was tending towards a kind of design perfectly suited to the use of terra-cotta. The rule which had hitherto determined all architectural expression was relaxed, and even reversed. In the blank tracery, the wall-panelling, the heraldry and heraldic badges, and in the ornamental scheme at large, it was the *field* which was worked down and reduced, a proceeding which was wasteful and irrational in stone, but which gave the clue to the absolutely proper treatment for clay. It was possible, in fact, to get by the use of terra-cotta a sort of *gesso* work in a far more pliant and accommodating medium. The kindly clay was responsive to the artist's lightest touch, suave, facile in the working and tenacious in its grasp of the life with which the artist's skill endowed it. Had not the possibilities of the older art, when confined to the traditional materials, been played out? And did the new material place in our hands opportunities for new and legitimate forms of expression? He had sketched the direction in which he thought such a result might be sought. If the idea was worthy of serious pursuit it was to the younger members of the profession to whom we must look for its realisation, whose freedom in design had not been hampered by the prejudices which cramped the youth of their seniors, and whose artistic education is so much more liberal, systematic, and complete.

Mr. S. H. Leech read a second paper on the subject, which treated in great detail of the technical *minutiæ* of the manufacture of the material, from the selection of the clay to the firing. The different varieties of clay suited to certain work, the mode of its manipulation, the various methods of burning for the production of certain effects of colour, and other highly technical details, were described and discussed, and in conclusion Mr. Leech referred to some new developments of cellular terra-cotta construction recently perfected by Messrs. Doulton. These were illustrated by large diagrams exhibited in the meeting-room. Messrs. Doulton also exhibited a large and representative collection of specimens of terra-cotta work, showing very clearly the wide capabilities of the material, whether regarded from the point of view of the size of blocks, the texture of surface, or the range of colour. We should have devoted more space to Mr. Leech's paper, but it was so full of technical details, and was so rapidly read, that it was not possible to take a reliable shorthand note of it,—for of neither of the three papers read were any copies or abstracts placed at the disposal of the Press, as is usual.

Mr. Leonard Stokes read a third paper. He said that Mr. Ingress Bell and Mr. Leech, having treated of terra-cotta from their own particular points of view, he proposed now to treat of the disadvantages and abuses of the material. But he felt that the disadvantages of terra-cotta had been so often made apparent, and that its capabilities had been so often abused, that words from him were almost superfluous. He simply proposed to take that much misused material as he found it staring him in the face in all its vulgar ostentation. He had never used the stuff himself, and he trusted that Fate would never deal so hardly with him as to cut him off from the use of honest building materials, and so send him to the crockery merchant in despair. Holding the views he did he felt that if he was to treat his subject honestly he should inevitably run the risk of bringing about his ears a host of terra-cotta hornets. However, undeterred by that consideration, he thought he should be able to make out a tolerable case against the use of terra-cotta. He held that terra-cotta (of course as generally used only) was nothing but a miserable mockery, composed of mimic masonry; that it had neither constructional, artistic, or businesslike advantages to recommend it; and that it was, therefore, unworthy of the consideration of the architect. Was he right in saying that terra-cotta had no constructional advantages over other and more natural materials. He thought so. In the first place, the usual terra-cotta block had practically no weight-carrying power, as it was simply a hollow cube, with one side open like a biscuit tin with the lid off. In order to make it do its work it was stuffed with cement concrete, and it was that stuffing which really did the work. Why not trust to the cement concrete alone, which, he believed, could be treated as terra-cotta was? Instead of that a brittle material was introduced, and we had a wall composed of three materials of unequal character: terra-cotta, concrete, and brick backing. In principle, he maintained that that was bad construction. Even though in practice the difficulties could be so far got over as to make a building stand, the result was no credit to the architect, who relied upon the manufacturer and the builder to get him out of his difficulties.

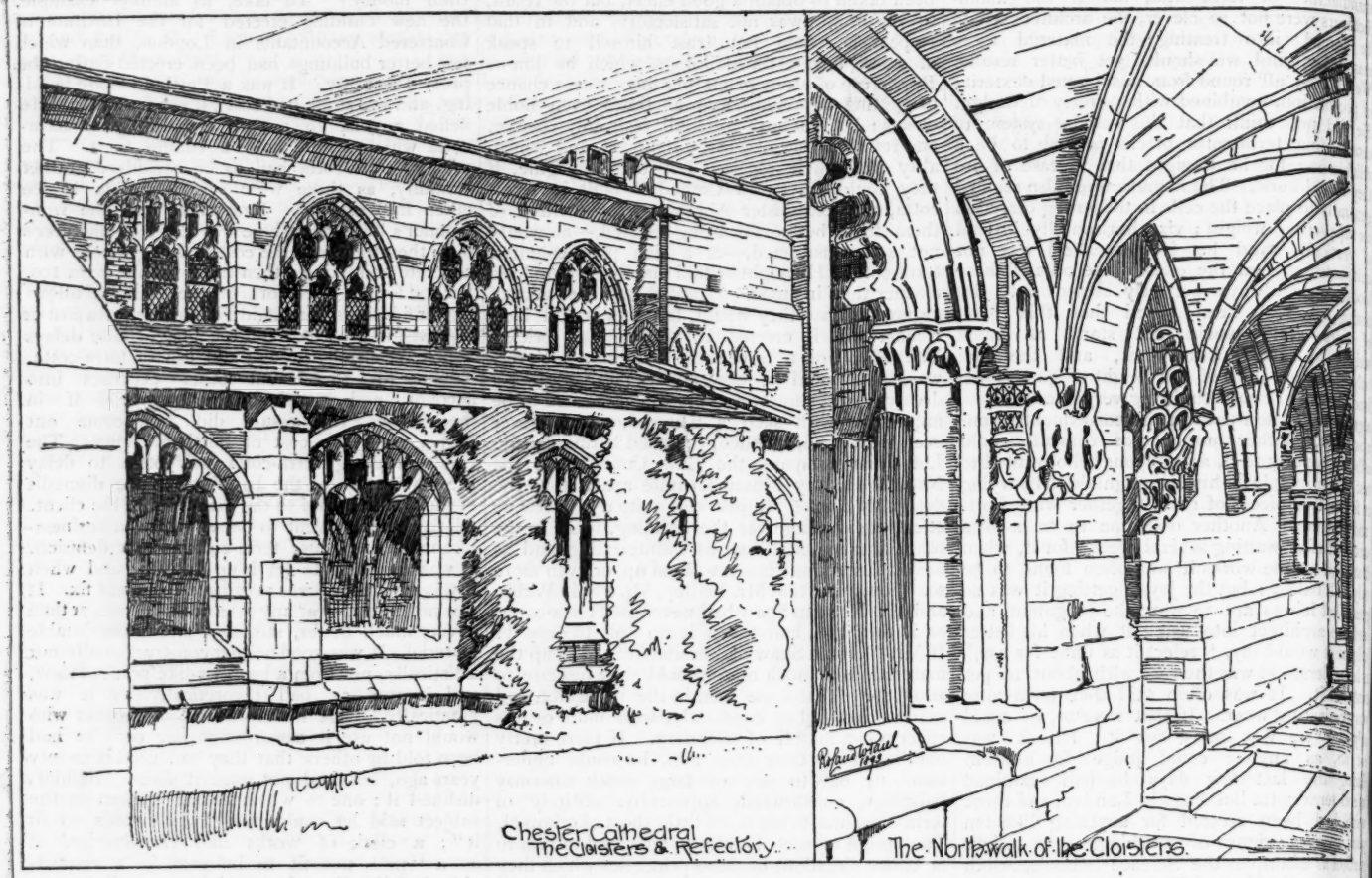
There was, no doubt, great skill shown in the manufacture of terra-cotta, but if the manufacturers were not so clever, the architect would be forced into treating the material more reasonably, and we should get better results. We suffered all round from misdirected dexterity of production, combined with poverty of design. He did not think that the cellular system of constructing terra-cotta blocks proved to be a reliable one, for he thought that in case of fire they would burst. The manufacturer also seemed generally to place the cells in the wrong direction for supporting weight; viz., horizontally instead of vertically, and he (the speaker) was not quite satisfied that the ends of the cells of these blocks were always perfectly closed up. By testing, it had been found that this form of terra-cotta would not stand as much weight as good brick-work, and therefore only about one-third of the weight of good Portland stone. Terra-cotta being very hard, and to a great extent non-porous, and consequently non-absorbent, neither mortar nor cement would adhere properly to it, and anyone who wanted to test this principle for himself might do so by trying to fasten two pieces of glass together with Portland cement. Another objection to terra-cotta was that after waiting several weeks for it, when it arrived on the works it was often found to be only half baked; but the joy of getting it was so great that it was apt to warp the judgment, and lead the architect into using it when his better judgment would say, "reject it as unfit for use," as he understood was the case with about 10 per cent. of it. It was often said that terra-cotta was everlasting wear. If that were so, he could only say he was sorry for it; but it was not so, as anyone could judge for himself. During the last few days he had examined several terra-cotta buildings in London, and those which had been erected for anything like ten years showed signs of crushing. He might mention as examples the Science Schools, South Kensington; the Natural History Museum; Albert Hall; St. Paul's School, Hammersmith; New Court, Carey-street; the Constitutional Club; and strange to say, the work in front of Messrs. Doulton's own office door at Lambeth. He had been told by a friend that he would never advocate the use of concrete constructionally except as a casing for the ironwork of shop-fronts, &c., for which use of it there was perhaps something to be said, although, as long as we could get such good shop fronts as that lately erected by the Orient Company in Cockspur-street, he (the lecturer) could only say, "Save us from spurious imitations!" He maintained that to conceal iron construction inside a make-belief stone design was most reprehensible. If terra-cotta was a proper material to employ constructionally, it would have been more largely used. Did anyone ever hear of engineers making use of it? he certainly knew of one use for it, viz., in damp-courses, where it answered its purpose tolerably well, although it looked extremely ugly. There was a church approaching completion not 100 miles from Soho-square, in which terra-cotta was used both internally and externally, and in which, he ventured to think, there were the usual mistakes in treatment. The nave and aisles were all of forms and lines suited only to stone work. When he visited the building he asked whether the terra-cotta piers and arches really carried the walls and roof above. "Oh, dear, no, sir," said his informant, "there is a solid iron stanchion inside each of the piers, and a girder over the arches; they take all the weight." The sectional area of these piers was, he found by measurement, 3 super. ft. Now, a manufacturer had told him that terra-cotta would carry 70 tons per foot super. If that were so, each of these piers ought to carry 210 tons, or rather more than ten times the real load, he should think. Evidently architects and manufacturers did not agree as to the strength and reliability of terra-cotta in construction. All terra-cotta buildings that he knew of in this country, or on the Continent, were designed and executed on quite different lines from those employed by modern builders in the material. All constructional blocks were small and solid, and were, strictly speaking, brickwork, and not what we called terra-cotta at all. Coming to the second head of his subject, was he right in saying that terra-cotta had no artistic advantages? He thought so; at any rate, he could not see any; possibly that was his fault. To him there was a most distinct and well-defined difference between architecture and ornament, proportion and mere prettiness, good building and showy vulgarity. To him, a great deal of terra-cotta looked about as lifeless as the work of a dead Chinaman. The Albemarle Hotel was a building in which much care had been taken to obtain a good effect, but the result, to his mind, was not satisfactory, and in that respect he could not trust himself to speak of some terra-cotta buildings which he knew. By the use of stone or marble there was a chance of getting dignified, and at times even noble effects; but in terra-cotta all restraint, reserve, and reticence seemed to be removed, and sensuality took their place. Let them imagine, if they could, St. Paul's Cathedral built in terra-cotta, or Westminster Abbey! Would either of them look better for being erected,—he would not say constructed,—of a rich plum-coloured terra-cotta? He might be told that they would look cleaner than in stone. Granted, for the sake of argument, that they would, but they would look cleaner still if erected in white-glazed bricks. The effect of a terra-cotta building, however, was, to his mind at least, always mechanical and dreary. Spontaneity and freshness seemed to be impossible with such a material, which never even weathered, blended, or toned harmoniously. Let them compare the Law Courts with the Natural History Museum, quite apart from the design, of course. In one case quite a picturesque effect was coming over the building, while in the other the material was as uninteresting and as unsympathetic as when it was put up, or even more so. How was it that Mr. Bodley, Mr. Philip Webb, and Mr. Norman Shaw had never used terra-cotta, or if they had, had taken it up only to drop it? If Mr. Norman Shaw had hesitated to take up the material, how much more should they hesitate to adopt it? That some men in the profession had used it, and did so constantly, with more or less effect was a matter of notoriety. If mere pretty building were their only aim, he could understand it, but to put up large mock masonry buildings, constructed, apparently, entirely of terra-cotta was to his mind little short of criminal. The design of such buildings appeared to him to be entire violations of those principles which they were taught to respect as students. The bad effect of these buildings upon the profession and the public at large was, he feared, retarding architectural progress, and was much to be regretted. He had been told that the old Italian terra-cotta buildings would have lost much of their charm if they had been erected in any other materials; but the real charm of the Italian terra-cotta buildings was that they were indigenous, and the natural outcome of local circumstances. The architects of old made the best of the materials on hand; they never abandoned stone for the sake of such an inferior building material as terra-cotta. We were now beginning to learn that there was a proper and legitimate treatment of cast iron, and it was to be hoped that some men would arise amongst us to show us what terra-cotta was really capable of as a material used architecturally. We now looked with righteous horror on the cement-covered churches of a past generation; how long would it be before our children arose in their turn against the earthenware erections of the present day? Thirdly, as to the business-like qualities of terra-cotta, it was a material which was miserably unbusiness-like. Putting on one side the trouble of drawings made extra-large full size for details, which might or might not allow for the exact amount of shrinkage of the work in burning, and which often nearly doubled the number of drawings, and consequently doubled the chances of mistakes, he would come to the question of cost. How did that stand this test? For his own part, he thought terra-cotta was dear at any price, but he believed that a well-designed building of a dignified character could be erected quite as cheaply in Portland stone as in terra-cotta. Why, then, use earthenware? He was not going to say that all terra-cotta buildings, with all their pretty prettinesses, could be erected for the same price in Portland stone. For purposes of comparison, he would take the Banquetting House in Whitehall as a Portland stone building, and the Constitutional Club, Northumberland Avenue, as an example of a terra-cotta building. He knew of two important buildings in London in which the average price of Portland stone was 6s. 6d. per foot cube fixed, and he had very good reason for believing that the terra-cotta of the Constitutional Club cost—or at any rate would cost to-day—quite 7s.* per foot all round, fixed. Which was the building for their money? To take, as another example, the new building erected for the Institute of Chartered Accountants in London, than which few better buildings had been erected during the present century. It was a Portland stone building, and the stone had cost 7s. per foot cube. He defied anyone to put up a building in terra-cotta which could hold a candle to it. The price of terra-cotta had to be considered rather carefully, as there were several points to be taken into account. First there was the iron-founder's bill; next there was the manufacturer's bill; then there was the cost of filling blocks with concrete and fixing; then there was an extra 10s. per rod for the brickwork, on the ground of allowing for fiddling about. Add to these the extra cost of supervision involved, and the unavoidable delays which occurred through the use of terra-cotta. Taking all these and other expenses into account, and he should be surprised if in most cases the result did not come out higher than the cost of Portland stone. The result of using terra-cotta was often to delay the completion of the building, to the discredit of the architect and to the great loss of the client. All these points went to prove that as a business-like material to use terra-cotta was a delusion. It was very hard to get it up to time; and when it was obtained it was very hard to fit and fix. It was not cheap, or at any rate not any cheaper than a very much better, stronger, and more durable material. It was good neither constructionally nor artistically, nor from a business-like point of view, and it was as bad theoretically as it was practically. He had consulted architects who would not use it constructionally, and he had been told by others that they had used it twenty years ago, but had not used it since. Builders disliked it; one to whom he had spoken on the subject said he could not "find words to fit it"; a clerk of works had characterised it as a "pest, not fit to be used in a respectable building," and an architect well known to fame had called it "filthy, degraded stuff." In conclusion, he would advise those who were thinking of using terra-cotta to adopt the advice of *Punch* to persons about to marry, viz.: "*Don't.*" At any rate, if they were obliged to use it, let them try to grasp the limitations of the material, which might, after all, be more suited to sculptors than to architects. Some of our leading and most eminent architects had used and were using the material, and should by now have become masters of it. If we were dissatisfied with the results we must therefore either blame the material or the men. He maintained that if they wanted to produce architecture they must use a material in which it was possible to express fine ideas on a fine scale. He did not wish it supposed that he wished to contend that terra-cotta should not be used at all, he did not go quite as far as that; but he contended that it was at any rate quite unsuitable for large public buildings like South Kensington Museum, for example. Terra-cotta had led some men so far astray that even when they *worked* in stone they *thought* in terra-cotta, and the result was often to make their stone buildings look as if they too had been burnt and had shrunk in the operation. Layer Marney Towers, in Essex, East Barsham and Oxburgh Halls, in Norfolk, and much of the work in the North of Italy, Holland, and Belgium exhibited the true treatment for terra-cotta, and not the buildings of Shaftesbury-avenue, Charing-cross-road, Kensington, or Hammersmith. He had only become a specialist on the subject during the last fortnight, but he had during that short time, as well as before, seen it made, used, and fail; he therefore had no hesitation in saying, as to the advantages of building in terra-cotta, "There are none."

In the discussion which followed,

Dr. A. S. Murray, Keeper of the Greek and Roman Antiquities in the British Museum, being called upon by the President, referred to a few small specimens of ancient Greek terra-cotta, which he exhibited. They dated from the early part of the sixth century B.C., and were found on the site of an ancient Greek colony at Civita Lavinia, near Rome, during some excavations carried out by Lord Savile. They were of the nature of slabs or tiles, and one specimen had moulded ornamentation on one face, while the other still preserved traces of colour decoration.

(Continued on page 174.)

* Mr. Stokes writes to us in reference to this point: "In order to show how I arrived at this figure, I had better perhaps give an extract from a letter which I received from a terra-cotta manufacturer who is well acquainted with the work at the Constitutional Club. He wrote me on February 20: 'The approximate price per foot cube for terra-cotta work like the Constitutional Club would be 5s. 6d. to 5s. 9d. per foot cube delivered at a railway station in London. I don't undertake the filling and fixing, and therefore regret I could not tell you what it would cost. Of course, the above price is not inclusive of any enriched modelling.' The price given me being 'at a railway station,' I added what I thought proper for carriage, filling and fixing, &c., and thus arrived at the approximate sum of 7s. per foot cube given above.—L. S."



Illustrations.

ROYAL ACADEMY DRAWINGS.

THOUGH it is perhaps hardly necessary for most of our readers, we may here formally repeat the offer which we have been in the habit of making for several years back, to take charge of and forward to the Royal Academy any drawings intended for the Architectural Room, and which the owners are willing that we should photograph for illustration in the *Builder*. Drawings so illustrated, if accepted at the Royal Academy, will have as usual a double publication; in our ordinary issue, and in our annual Album of Royal Academy drawings, a copy of which is presented to every contributor of a drawing.

CHESTER CATHEDRAL.*

THE present see dates from the reign of Henry VIII., who created it in 1541, and converted the Church of the Benedictine Monastery of St. Werburgh, founded by Hugh Lupus, Earl of Chester, in 1095, into the Cathedral of the Diocese. It is still a building of considerable interest, although at first glance the feeling is distinctly one of disappointment. The red sandstone of which it was built weathered badly, and in the fifteenth century this was no doubt the cause of a good deal of the recasing that was done. In the present century the process has, from necessity, been repeated to a very large extent; the restored parts being, however, in Runcorn stone, and more durable than the ancient material, and this gives to the exterior of the cathedral that modern appearance which is, perhaps, more noticeable on the side from which it is generally approached—the south—than any other. What the state of the building was before the restoration, which began in 1844, under the late Dean Anson, can be gathered from engraving and photographs of the period, and it will be seen by them that almost every particle of detail had been destroyed, or had so crumbled away as to require rebuilding. It is, nevertheless, a building that contains much that is highly valuable, and the monastic buildings which are grouped round the cloister on the north side are in a very perfect condition, and rank, next to Canterbury and Durham, with the best of our examples of conventual buildings attached to what is now a cathedral establishment.

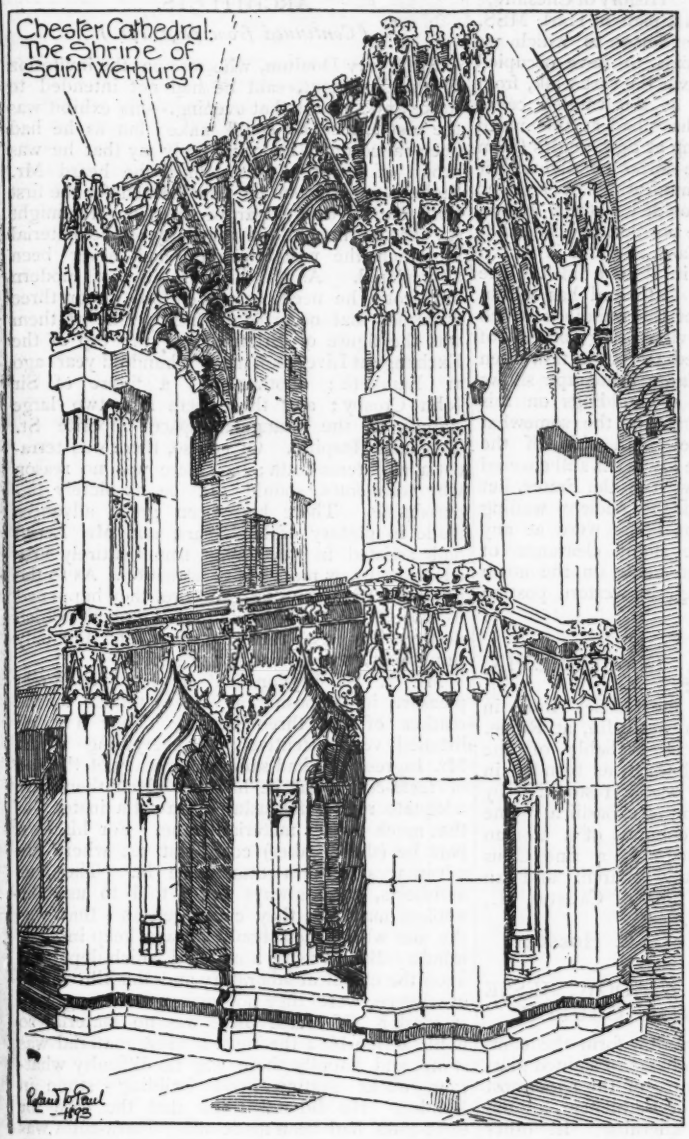
The church itself consists of a nave of six bays with aisles, the bases of two west towers and a south porch, transepts with a central tower, and a choir and presbytery of five bays with aisles, beyond which extends a Lady Chapel of three bays, with a side chapel on its north side, with which formerly corresponded a similar chapel on the south, now, however, destroyed. The most marked peculiarity of the plan is the unusual size and importance of the south transept, which is of five bays with side aisles, and equals in length that of the choir and presbytery. It was formerly partitioned off from the cathedral at the first bay south of the central tower, and was used as the parish church of St. Oswald. It has now been again opened to the cathedral.

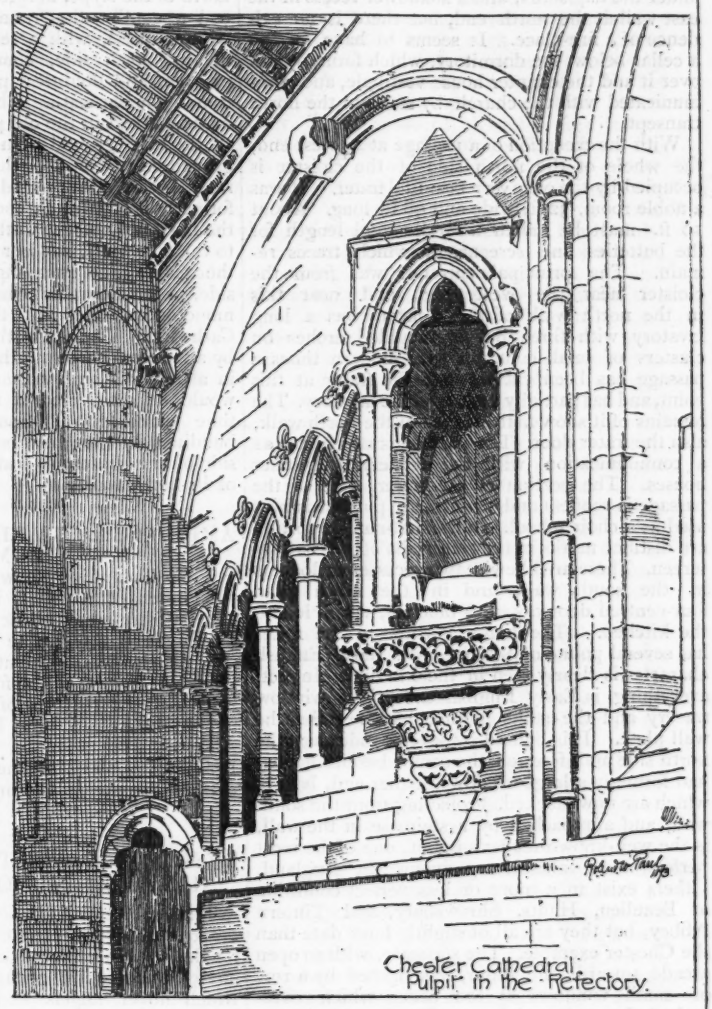
Chester Cathedral, although from external appearances a building of late date, retains a considerable portion of the Norman church—enough, indeed, to enable us to ascertain with a degree of certainty its form and extent. The present remains of Norman date consist of the base of the north-west tower and its arches into the church, the whole of the north aisle wall of the nave, the north transept, and the core of the piers of the central tower. Eastward we have still visible in the first bay of the arcade on the north the bases of two of the Norman columns of the choir of rather over six feet in diameter, and further eastward in the last bay but one of the presbytery aisles are the positions, marked by stones inserted in the pavement, of the two apses which terminated the aisles. Mr. R. C. Hussey, who was then architect of the restoration, discovered the columns of the great central apse, and he described them in a short paper illustrated by a ground plan, published in the fifth volume of the *Archæological Journal*, from which we have taken the indications of this portion of the church shown in the ground plan now published, and which are of course now under the pavement, and therefore invisible. Two very interesting fragments are still in place however. On the north side of the arcade of the presbytery is a piece of Norman walling with the remains of two small columns undoubtedly, from its position, the remains of the arch at the springing of the small apse. Again, on the exterior of the south wall of the presbytery the springing of the southern apse has been disclosed, with a small Norman pilaster buttress, still showing. These remains, with the existing outer wall of the nave, prove that the width of the Norman church was identical with that of the present one. There were apsidal chapels on the east sides of the transepts. The arch can be still seen in the north transept wall, and the springing of the apse is still visible in the pavement near the entrance from the north aisle of the choir, to the small Transitional chapel of two bays which has replaced the earlier one, and which is the only example of this period in the church.

The work of the Early English period is confined to the eastern arm of the church. It appears to have been entirely rebuilt at this time, the presbytery being lengthened two bays, and having a lady chapel thrown out eastward. The aisle terminations were again apsidal in form, semi-octagonal on plan, and the remains of this are clearly visible just east of the large square turret on the north side. The south end has been restored by the late Sir Gilbert Scott on the old lines. The Early English presbytery terminated in a massive wall pierced by a deeply-moulded arch below, and this wall and the first two bays westward of it on the north side appear to be the earliest portion of the work, the corresponding bays on the south being of slightly coarser detail. The remaining three bays are distinctly later still, and the columns are of an altogether different section, and approaching more towards the Decorated style. It must not be overlooked that the whole of the choir and presbytery has,—as far as its fittings are concerned,—been shifted considerably eastward. The stalls and choir proper were under the central tower, and the high altar was one bay further west than at present. This admitted of a procession path or ambulatory round the east end behind the reredos, and gave space for the shrine of St. Werburgh which stood in this bay, in all probability in a corresponding position to those of St. Albans and Westminster.

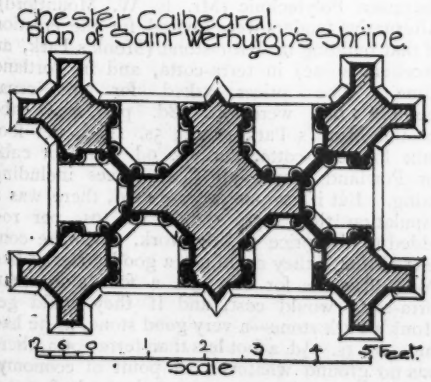
The Decorated work in the church was more extensive. A good deal of the window tracery in the choir aisles was remodelled, and the whole of the arcading and aisles of the south transept and the greater part of the nave are of this period. There was not in its design any unusual feature. The window tracery was of flowing design, and the piers were clusters of eight columns arranged round a central pier of square form set diagonally. Preparations were made for vaulting, but the transept and its western aisle were never completed, the aisles of the nave were carried out in Perpendicular times, and the nave itself is covered by modern vaulting. The east aisle of the transept was also vaulted at the time of the restorations. The clearstory of both nave

* This series of illustrations of the Cathedrals of England and Wales was begun in our issue of January 3, 1891. A list of those already illustrated, with particulars of future arrangements, will be found on page 184.





and transept are Perpendicular. To this last period belongs the west front, and one or two of the columns of the north nave arcade have been rebuilt by and bear the initials of Abbot Simon Ripley, who, with his successor, John Birchenshaw, made considerable alterations to the fabric in the fifteenth and early part of the sixteenth centuries (1493—1537). The casing of the tower arches and the upper portion of the tower itself were probably included in these works. The tower, however, was practically rebuilt by Sir Gilbert Scott during his restoration, which began in 1868. Of the other portions of the fabric of the Perpendicular period those not already mentioned are the base of the south-west tower, now used as a Consistory Court, and the chapels flanking the Lady Chapel. Of these latter only the north chapel remains. The other has been pulled down, and that side of the Lady Chapel against which it abutted rebuilt, as was also the east end.



Chester is not rich in monuments, the only one remaining being a tomb of late date, and two early slabs under canopies in the south aisle of the presbytery. It, however, fortunately has preserved a considerable portion of the shrine of St. Werburgh, which, after serving as a bishop's throne, now stands under the arch at the east end of the presbytery, being in as near a position to that which it occupied originally as the altered position of the sanctuary would allow. It is altogether about 14 ft. in height, and consists of two portions. The lower half is solid, being pierced at the sides by two recesses, and at each end by a corresponding one. At the angles are buttresses, which are plain below but pannelled above, and terminate in canopied arches with figures. The sides of the upper portion are divided into two bays, with open tracery enclosed by arches and crocketted gables. Over all is an open cornice and cresting. In plan the shrine is oblong, measuring, exclusive of the buttresses, 5 ft. 7 in. in length, and 3 ft. 3 in. in breadth. It has been raised on one step. The whole is of Late Decorated date, and is an interesting example for comparison with the other shrines in the country, which differ from it considerably in proportion, and lack the dignity which is given to the Chester shrine by its great height. We give a view of this shrine as it stands at present, the missing portions being made up with modern masonry left in the block. Some of the missing fragments are, we understand, still in the neighbourhood of Chester.

The choir stalls are, to a great extent, ancient, of Perpendicular date, and exhibit many beauties in the carving of their canopies and the grotesques and figure subjects of the miserères and stall ends. All the other fittings are modern. The organ now stands on a loft erected under the north arch of the central tower, and is not happy in design. The modern monuments are also more remarkable for their incongruity than for their beauty, and nothing could well be less satisfactory than the clumsy monument erected to Bishop Pearson, who died 1686, which fills up a large amount of the space in the centre of the north transept.

Two doors in the wall of the north aisle lead to the cloisters, that at the east end being Norman, that at the west end a Perpendicular insertion.

The cloisters themselves are of Late Perpendicular date (the South Walk has been rebuilt on the old lines), but round them on the north-west and east sides are grouped a highly interesting series of early monastic buildings. On the east side is the chapter-house, approached through a vestibule, and beyond it, separated from it by a slype or passage which led to the infirmary, a vaulted room of three bays running north and south. The north side of the cloister is entirely occupied by the frater, while against the west walk is a building of Norman date, occupying the whole length of this side of the cloister, with the exception of a passage next the church, which communicated with the buildings which extended west of the church.

The whole of the outer wall of the cloister on the north and east is Early English, and the buildings on those sides are of the same date, the only exceptions being the alterations and additions which were made to the frater in Perpendicular times.

The chapter-house is a very fine room, 50 ft. in length and 27 ft. in width, vaulted, and lighted by lancets in triplets at the sides, and a group of five at the east-end. The exterior of it is prominently shown in the general view of the cathedral in this number. There is some excellent modern glass in the east window. It is approached from the cloister by a vestibule divided into three alleys by columns without caps. The entrance from the cloister has been considerably restored, and the doorways communicating with the north transept on the one side, and the slype on the other, are also modern. The slype itself, which adjoins the vestibule on the north, and is also approached from the cloister, is vaulted, in four bays, but there is no point of detail requiring special mention. Beyond the entrance to this passage, and near the north-east angle of the cloister, is a doorway leading to a broad staircase, which formed a communication between the cloister and the dormitary which ran over it, and known as the day stairs. Eastward of these stairs is the

vaulted room before mentioned, divided into two aisles by two octagonal columns carrying the vaulting. It is lighted at its north end by two sets of short lancets, and measures 38 ft. in length and 27 ft. 6 in. in width. The precise use of this room is not very clear. There are two deep recesses in its west wall under the day stairs, and a shallower recess in the east wall at the north end, but there is no evidence of a fire-place. It seems to have formed a cellar below the dormitory, which formerly ran over it and the chapter house vestibule, and communicated with the church by stairs in the north transept.

With the exception of a passage at its west end, the whole of the north side of the cloister is occupied by the once very beautiful frater. It was a noble room, 32 ft. wide and 98 ft. long. About 10 ft. must be taken from its total length for the butteries and screens, of which traces remain. The principal entrance was from the cloister near the west end, and near this in the north walk of the cloister was a long lavatory with three deeply moulded arches on clusters of small columns. In modern times a passage has been cut through the frater at this point, and has partially destroyed the lavatory. The remains of it show in the sketch of the north walk, also the frater door. The passage is still in use as a communication with the deanery and other houses. The portion of the frater west of the passage is roofless and the eastern portion is now used as a choir school. In the first-named portion are distinct marks in the side walls of the buttery screen. There are likewise two recesses or lockers in the south wall, and in the north is a four-centred doorway, now blocked, which led to the kitchen. The larger portion of the frater has several points of interest. Its Early English character is clearly seen in the interior. In fact, everything is Early English except the window tracery and the stone cornice which carried the wall plate. It is lighted by seven windows on the north side and four on the south, besides having had formerly a large window at either end, both of which are now blocked. Projecting from the south wall, and approached by a staircase in the wall, is the well-known reader's pulpit, one of the most perfect and valuable specimens in England. Others exist in a more or less perfect condition at Beaulieu, Hants, Shrewsbury, and Tintern Abbey, but they are all of slightly later date than the Chester example. The staircase, with an open arcade towards the frater, was lighted by a row of small windows at the back, which overlooked the earlier cloister. They appear in the sketch we give of the exterior of the frater, but are now blocked up. The rear-arches of the Early English windows (which were probably groups of lancets) remain; perfect, the windows themselves having been altered to Perpendicular. A good deal of the exterior generally seems to have been recased, and the buttresses are likewise Perpendicular, although doubtless standing on old foundations. A good deal has recently been done to clear out the disused portion of the frater, west of the passage; and it is to be hoped that steps may shortly be taken to re-roof this portion of it and arrest any further decay.

The passage which ran north and south at the west end of the frater is now closed a few feet distant from the cloister end by the modern house, which has been built on the site of this and the last bay of the Cellarer's Buildings. This last-named building is Norman, and, therefore, the earliest of the monastic buildings now remaining. It was a long vaulted apartment of seven bays, divided into two aisles by a row of circular columns carrying the vaulting. The west side was lighted by a series of lancets, which has been a good deal interfered with in later times. Towards the cloister, however, two narrow openings appear to have been the only means of obtaining light from that side. The building, which was probably a cellar, has had two halls over it, approached by the staircase from the cloister, and divided at this point by a wall, which is shown to have existed by the treatment of the vaulting at this point. One of these was known as the Green Hall, probably the smaller of the two occupying that portion north of the staircase. The passage between this building and the church led to the buildings west of the church in the outer court of the Monastery. It is also Norman, with doorways at either end. It is now used as a wood store. West of this are new buildings standing on the site of old buildings formerly monastic, and in some cases built over ancient crypts. The only portion, however, remaining visible of the outer court is the great gateway, a simple building of some dignity, and remarkable for the span of the arch over the entrance.

The monastic buildings now destroyed are shown in a plan in Lyson's "History of Cheshire," which has been taken from a plan in Harl. MSS. 2,073. The dormitory or dorter to which we have already referred, seems to have occupied the whole of the space over the east walk, from the north transept as far as the vaulted cellar north of the slype, and to have had at this north end a continuation running at right angles (from west to east), with a rere-dorter parallel with it on its north side, communicating by a short passage, and doubtless provided with a stream running underneath. The position of this building is marked in the old plans, and and is shown on the large ground plan in dotted lines. The ground on this side of the Cathedral has within recent years been cleared of the buildings which formerly prevented a good view being obtained of the north side of the Cathedral. It is now open to the city walls, and our large lithograph shows the picturesque grouping of buildings on this side, a considerable contrast to the somewhat monotonous lines of the south side of the Cathedral. The site of the kitchen is still covered by a modern house north-west of the Frater, but in all probability much of the ancient walling would be discovered if the house were at any time pulled down. Some slight clearance of buildings has recently been made on the north side of the Frater, exposing the western postion of its north wall.

AMBO, STA. MARIA IN COSMEDIN, ROME.

THIS illustration shows the Gospel Ambo in the church of S. Maria in Cosmedin, at Rome. The Easter candlestick is probably of the thirteenth century. The church was founded in the fourth century, but was "restored" by Adrian I. in 782, in the form of a Basilica. One wall has the remains of columns of a Roman temple built into it. There is a fine Opus Alexandrinum floor in the church, and an Episcopal throne, of the time of Calixtus II., early in the twelfth century.

G. C. HORSLEY.

DESIGN FOR WEST WINDOW, JESSE HAWORTH MEMORIAL CHURCH.

THE subjects in this window form the commencement of a complete scheme of stained glass for the church. In the centre of the uppermost circle of tracery is the Star of Bethlehem, around which hover angels and cherubs. In other tracery openings and heads of lights a heavenly choir heralds the advent of our Lord. The Nativity, with shepherds and magi, fills the middle openings of long lights, and the lowest openings are occupied by the Baptism, the Presentation in the Temple, and the Disputation with the Doctors.

The window has been made to this design, and is now fixed.

The main outlines for the complete scheme were laid down by the architects of the church, Messrs. Booth & Chadwick, of Manchester. The window is executed by Mr. W. Pape, of Leeds, and the drawing of it was exhibited in the late Royal Academy exhibition.

COMPETITIONS.

FRAMLINGHAM MILLS GRAMMAR SCHOOL FOR GIRLS.—We hear that sixteen sets of designs were submitted in competition for this school, and the selected plans were by Mr. Frank Brown, architect, of Ipswich. The designs of Messrs. George J. and F. W. Skipper, architects, of Norwich, were awarded the second place, but the premium was declined, the architects preferring to have their drawings returned to them.

VERDIN TECHNICAL SCHOOLS, WINSFORD AND NORTHWICH.—The trustees of the Verdin Fund (which was at first given for the purpose of compensating sufferers from subsidence in the brine-pumping districts of Cheshire, but afterwards devoted to technical education and allied purposes) had before them, on the 22nd ult., fourteen sets of plans and designs for technical schools to be built—one at Winsford and a similar one at Northwich, at a cost of 4,600*l.* each. Premiums were offered for the best designs, and these were awarded as follows:—First premium, 50*l.*, to Messrs. Woodhouse & Willoughby, Manchester; second, 15*l.*, to Mr. Joseph Cawley, Northwich; and third, 10*l.*, to Messrs. Goldsmith & Son, Manchester. The plan includes lecture-hall to seat 250, gymnasium, art school, small lecture-hall, class-rooms for cookery, laundry work, chemistry, ironwork, wood-carving, modelling, &c.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

(Continued from page 171.)

Sir Henry Doulton, who rose on the invitation of the President, said he had not intended to make any remarks that evening,—his exhibit was the best speech he could make; but as he had been called upon he could only say that he was proud of being a potter until he heard Mr. Stokes's paper; but he now learned for the first time that it was a vulgar occupation. He might say that he thought the plasticity of the material in which the potter worked had never been appreciated. As to the durability of modern terra-cotta he need only mention two or three examples that occurred to him. One of them was the figure of Britannia on the top of the Exchange at Liverpool, made a hundred years ago at Lambeth; another was a figure of Sir John Crosby; and there were also two large statues in the triangular space opposite St. Thomas's Hospital. Of course, there was terra-cotta and terra-cotta; but there was no reason why terra-cotta should not be absolutely imperishable. There had been great advances made in pottery of late years, and Mr. Leech had assisted in developing some entirely new effects and new modes of construction. As to the power of terra-cotta to resist fire, they happened to have had a large fire at Lambeth which destroyed some of their buildings, and the only thing which stood was the terra-cotta.

Mr. J. M. Brydon said he had very great pleasure in proposing a vote of thanks to the readers of the three papers. They had all listened very attentively to everything which Mr. Ingress Bell had said in advocacy of the use of terra-cotta, but he had not given them any adequate reason for using terra-cotta instead of that much nobler material, stone. For his own part he (the speaker) could not see where the advantages of terra-cotta came in. They, as architects, were always being told to use the noblest materials they could get, and that was the aim which they should always keep in their minds. But in using a material which depended upon the chemical laboratory and the kiln for its excellence, were they not going the wrong way to work? Of course there was no material so noble as marble; the next noblest material was stone, and happily there was no difficulty whatever about getting good building-stone in London. He did not think that the case for terra-cotta had been made out. Terra-cotta was not a nobler or more enduring material than stone, nor was it one likely to produce nobler or more enduring buildings. The fact that it could of necessity only be used in comparatively small blocks cramped the design and hampered the designer. In the case of small buildings in the country terra-cotta might perhaps be appropriately used to some extent, but when we were erecting public buildings we should use stone, the noblest material to be had. One of the grounds on which the use of terra-cotta had been advocated was the alleged economy of the material, but he should be very much disposed to question its economy. Knowing that the subject was coming before the Institute, he had taken the trouble to ascertain in two or three directions the relative cost of stone and terra-cotta when used in London, and he had been told by several of the leading builders of London that they would rather erect a building twice in stone than once in terra-cotta, owing to the cost and difficulties and delays involved by the use of the latter. He might mention some figures which had been placed in his hands by the architect of the Battersea Polytechnic (Mr. E. W. Mountford). Alternative tenders were invited for the erection of that building in Bath stone (Monk's Park, an excellent stone) in terra-cotta, and in Portland stone. The prices asked for the ornamental work were 4s. 8d. per foot cube for the Monk's Park stone; 5s. 11½d. per foot cube for terra-cotta, and 6s. 9d. per foot cube for Portland stone—all these prices including fixing. But if terra-cotta were used, there was a stipulation that there should be 10s. per rod added to the price of brickwork. Now he contended that if they could get a good material like Portland stone for only 9d. a foot more than terra-cotta would cost, and if they could get Monk's Park stone—a very good stone, as he had said—for 1s. 3½d. a foot less than terra-cotta, there was no ground whatever, in point of economy, why they should use terra-cotta instead of stone. Of course he knew that they could not produce elaborate detail in stone at the same cost as in terra-cotta; but did they want all that surplus ornament? He thought not. The fact was that

architects were learning to erect buildings like furniture; they were not doing big things, but they were doing small things bigly, and they were therefore on the wrong tack. He held that to construct in terra-cotta was wrong, for terra-cotta was a decorative material pure and simple. Why should they put up immense and elaborate buildings in a material that had to be baked in kilns, when they could erect the buildings so much more satisfactorily in stone? Though he held that the case for terra-cotta had not been made out, he had very great admiration for the efforts which had been made in surmounting the difficulties of its manufacture. He hoped that architects would all come back in time to good old honest building in stone.

Mr. C. F. Hayward said that he was familiar with the ancient terra-cotta work at Layer Marney, mentioned by Mr. Stokes. The work there was, as far as he knew, in solid blocks, as had been stated. Some of the ornament on it would compare very favourably with the specimens before the meeting. As the durability of terra-cotta had been called in question, he was bound to say that the terra-cotta at Layer Marney had stood very well ever since it was put up in 1530, or 360 years ago. As a further but smaller testimony in the same direction, he might mention that twenty-eight years ago he was erecting a very large building of its kind at Plymouth. The materials intended to be used were granite with limestone dressings. During the progress of the work there was a strike of masons, and the work came to a standstill. The late Mr. Blashfield, of Stamford, who would be remembered by many as a manufacturer of terra-cotta, appeared on the scene, and offered to execute the details of the building in terra-cotta. The offer was accepted and the work executed, and it had admirably stood the weather to which it was exposed from the south-west—weather which was very destructive to stonework generally.

Colonel Edis expressed his surprise that Mr. Stokes, who had confessedly never used terra-cotta, should presume to speak so strongly against its use. He had, in fact, shown his ignorance of the subject. As to the question of cost, Mr. Stokes was utterly wrong; the cost of the terra-cotta at the Constitutional Club was nothing like so much as had been stated. Was there to be no progress in building? Was no use to be made of an admirable material like terra-cotta,—a material likely to withstand our town atmospheres much better than stone? Were they not all aware that the only stone to be depended upon in the London air was Portland stone? But much of the Portland stone in London buildings was showing signs of decay. The brilliant whiteness of some of the Portland stone used at Somerset House and St. Paul's was evidence of decay in progress. As to using Bath stone in town buildings, could anyone be really serious in making such a proposal, in face of the costly reparations which had had to be made wherever that material had been used in London? He was astounded at Mr. Stokes's statement that terra-cotta was not a constructional material. That statement was wholly incorrect. Terra-cotta blocks of good material did not need to be filled up with cement concrete, and they would stand weight better than many stones. Then as to the statement that the builder would want to be paid something extra for the brickwork where terra-cotta was used, did anyone ever know a builder who did not want more money for something or other? Of course, if a builder asked for more money for his brickwork because terra-cotta was used instead of stone, he would get it if he had a credulous architect to deal with, but not otherwise. Having himself used terra-cotta very largely, and hoping still to use it very largely, he was convinced that it was one of the most suitable materials to use in cities like London. He was sorry that he was not able to be at the meeting in time to hear Mr. Ingress Bell's paper, because that gentleman had been associated with Mr. Aston Webb in the production of one of the most artistic buildings of this country, the Birmingham Assize Courts,—a terra-cotta building. Although the potter's art had been sneered at, it was one of the greatest arts the world had ever known.

Mr. James Neale said he had much pleasure in seconding the vote of thanks to the readers of the papers. The meeting was especially indebted to Mr. Ingress Bell for the moderate way in which he had put the case for terra-cotta, and to Mr. Leech for having told them so much about the technicalities of terra-cotta production. They were also indebted to Sir Henry Doulton for having sent for their inspection so interesting a collection of specimens of terra-cotta. The only feeling that he (the speaker) had regarding those specimens was that they were too good,—too alluring by their attractiveness. He personally objected to using terra-cotta, because he thought that its prettinesses were apt to carry one away. The meeting had been told that they need not, with terra-cotta, have plain plinths,—that they could have any ornament they desired upon them. Now he thought that that very facility for ornamentation was going to be the ruin of terra-cotta work. Whatever might be their opinions as to Mr. Stokes's views, they must all admire his thorough candour.

Mr. Aston Webb said he thought that Mr. Ingress Bell had put the case for terra-cotta very admirably, and had answered by anticipation some of the objections urged against that material by Mr. Stokes. Mr. Stokes had questioned the durability of the material, but he had skimmed very lightly over that part of the question. He thought that if Mr. Stokes, in the course of his fortnight's peregrinations, had met with any seriously decaying terra-cotta building he would have given them a picturesque account of it. With regard to the charge against terra-cotta that its use involved concealment of construction, there was, no doubt, some truth in it, but the same thing was equally true of a great many modern buildings (even where terra-cotta was not used), owing to their complexity. The old teaching at the Architectural Association twenty years ago, that construction should never be concealed, was charming in theory, but it could not very often be thoroughly carried out in practice. The critics of terra-cotta and its users should bear in mind that the material was practically a new one, and that in using a new material mistakes were at first almost inevitable. He thought that those who criticised the material would do well to try and work in it, and endeavour to show how it could be best and most appropriately used without mistakes. That would be a much better course to take than to avoid the material altogether. Terra-cotta was a new material, in which architects might obtain new effects, and it was therefore not a material which could be lightly discarded.

Mr. Lloyd Edwards, of Ruabon, being called upon by the President, said he thought Mr. Stokes was in error as to the cost of the terra-cotta work at the Constitutional Club. Mr. Stokes had evidently founded his remarks on that subject upon a quotation for terra-cotta work, based on no drawings or other precise details, which he had obtained from him (the speaker) about ten days ago. He was principally interested in the subject from a manufacturer's point of view, but he might perhaps be allowed to say that he was no advocate for the use of terra-cotta in imitation of stone; he believed it was much better employed when used in small blocks. He confidently looked forward to the time when terra-cotta would have a treatment of its own. It was a mistake to treat it in a stone manner; architects who treated it in that way would never be successful with it.

The President, in putting the vote of thanks, said that at that late hour (10.30) he would not detain the meeting with any remarks of his own on the subject of the evening, which was one upon which there was a good deal to be said on both sides. With the vote of thanks to the authors of the papers, he begged to couple the names of the several manufacturers who had kindly sent specimens,—viz., Messrs. Doulton & Co., Mr. Edwards, Messrs. Gibbs and Canning, and the Burmantofts Company.

The meeting then terminated.

ORIGINALITY AND INDIVIDUALITY IN ART.*

IN making a few observations to-night on the subject of Originality in Art, I shall begin by offering the smallest possible contribution to the literature of the much-vexed and well-worn question, whether or not a new architectural style is possible. The question seems to me a perfectly futile one, but there have been not a few in the past who have been unwilling that the nineteenth century should pass away without having affixed its signature definitely to some new development, or even to some new birth, always to be associated with its name thenceforward. Such an aspiration tells for me a sad story of self-importance, and is indeed no bad symbol of an age which has created advertisement as a fine art. A style started under such auspices, properly perfected in all its parts, and duly patented, should, in the eternal fitness of things, become the stock-in-trade of a limited liability company, pass through a fitful and fevered span of existence, secure, who knows, a quotation on the Stock Exchange, and be buried at last with becoming obsequies by an official receiver. Let the style grow if it will,—but let the aspiration take care of itself. I can conceive of no Zeus among architects from whose teeming and fertile brain such another Pallas Athene should spring, fully grown and completely equipped? When, indeed, we may ask, in the whole history of the world has there been originality in the sense of absolutely new invention? Modification and evolution have been the watchwords all through. Those who cry out for an original style ask, as I understand them, for a tabula rasa on which to inscribe hieroglyphics never before seen, or combinations of forms without precedent. They ask for an artistic cataclysm, for a labouring of the mountains and a new and strange birth, but history will tell them that the most fundamental changes have been happened on rather than discovered,—that forms have existed as results before they were recognised as the embodiment of new principles, and the starting-point for fresh enterprise. All growth must be gradual; the new must germinate in the decay of the old: there is no solution of continuity in the process, no moment at which you can say that the change in degree has become one in kind, or you might argue that one moulding makes a style, as the Sophists of old that one grain makes a heap. Further than this, all experience tells us that in the sphere of Art, unlike that of Science, the limit of perfectibility is reached while the study is still, comparatively speaking, in its youth. "Those arts," it has been said, "which depend on individual genius and incommunicable power have always leapt at once from infancy to manhood, from the first dawn of rude invention to their meridian height and dazzling lustre, and have in general declined after. This is the peculiar distinction and privilege of each, of science and art; of the one never to attain its utmost limit of perfection, and of the other to arrive at it almost at once. In after ages great men have arisen, one by one, as it were, by throes and at intervals; but, in the earlier stages of the arts, they rose by clusters and in constellations";* but I am flogging a dead horse, and am content to believe that the day for such crude imaginings has gone never to return, and that every one of us here realizes that the mere entertainment of such an ambition stamps a man as singularly ill-fitted to make the experiment. For my own part, I wish we could sink styles in style, and cultivate pure beauty of form and constructive propriety without troubling ourselves in any given instance what our sources of inspiration may be, or whether or not—if we care to run them to earth—they are all referable to one date of work. It is not everyone who can practise so bold an eclecticism, if I may use such an expression of an artist whose work can never have been consciously derivative, as Mr. John Sedding: to attempt to conjure with edge-tools, as he did, is for the prentice-hand to court death by the happy despatch; but when once we have gone thoroughly and systematically through the educational mill, when the mind has been impressed for good and all with the varied outcome of centuries of artistic energy, all of which the man of broad sympathies, who can fee the common principles underlying the different forms, may well enjoy; when the artistic sense has been cultivated and the proper appreciation of beauty has become an instinct, then it is time to throw off the leading-strings which, when they have ceased to guide, have begun to hamper us, and step boldly out into the field of practical architecture to do or to die.

One sees the pedantic attitude of mind to which I demur—the cultivation of the letter rather than the spirit—in the small body of amateurs who make the study of architecture their relaxation, and one sees it there perhaps at its worst. The building is too often a vile body on which to test a knowledge of styles and dates rather than the thing of beauty, and more importance is attached to the docketing and pigeon-holing of details, than to getting a large and comprehensive grasp of the whole. It will be understood that I am only speaking suggestively, but I have no doubt whatever that it is too often forgotten that the building which is a masterpiece should be approached in the same way as the book which is a classic. Dr. Johnson has told us with convincing wisdom that the beauty and unity of a great conception should not be broken, or its thread interrupted, by a reference to the notes on

W. Hazlitt.

* A Paper by Mr. Arthur Edmund Street, F.R.I.B.A., read before the Architectural Association, on Friday, February 24.

a first reading; "Notes are often necessary," he says, "but they are necessary evils. Let him that is yet unacquainted with the powers of Shakespere, who desires to feel the highest pleasure that the drama can give, read every play from the first scene to the last with utter negligence of all his commentators. When his fancy is once on the wing, let it not stoop to correction or explanation . . . and when the pleasures of novelty have ceased, let him attempt exactness and read the commentators." I suppose the commentator in our case is, strictly speaking, the Verger, whose mission it is to turn poetry into prose, but his mistake is shared by many in an unofficial way. I have been speaking of the mote in my brother's eye, but it does not follow that we have not a beam in our own; as a matter of fact, if not such sinners in our own persons, we must be held ultimately responsible for the shortcomings of others.

Let us hear what the oft-quoted Montaigne has to say on the subject: "When I hear our architects," he says, "mouth out those big and rattling words of Pilasters, Architraves, Cornixes, Frontispieces, Corinthian and Dorike works and such-like fustian terms of theirs, I cannot let my wandering imagination from a sordaine apprehension of Apollidonius his pallace, and I find by effect that they are the seely and decayed pieces of my kitchen-doore."

Montaigne was common-sense personified, and gifted with that sort of perspicacity which makes his criticism valid for all time, and it is good for us to know how the hyper-professional attitude struck him, that seeming desire—if it is not a real one—to create a shibboleth, to make something of a trade secret of what is intelligible to any cultivated taste. But to look at the same failing in another aspect, I do not know what may be the experience of others—but I have frequently been confronted in the intelligent world of art with a feeling of resentment, not more at the rigid adherence of a modern building to an old model, when there was no special suitability to suggest it, than at its being deliberately labelled with the name and title of the type to which it conforms. For an architect to bind himself hand and foot to the rigid exercise of one style, no matter how varied the requirements he has to fulfil, if it is to cultivate dexterity at the sacrifice of the taste, judgment, and discrimination which a more liberal appreciativeness or a less cautious attitude will keep in constant activity, is at least a course which has its merits and claims our respect, but for the same man to say, Now I am going to design in the Perpendicular style, now in the Jacobean, now in that of Henri Quatre; to work professedly under several recognised sets of conditions, adhering blindly to precedent in each, and following the model with Academic scrupulousness,—in a word to be on terms of distant acquaintance with all, and familiar with none—does, indeed, seem the way to quench the spirit and leave nothing but the dry bones for our delectation. "Warnut I says, and I ups and gives it a twiddle this way"; it is nothing but the attitude of the shoddy wood-grainer writ large.

I take it that no self-respecting man is a consciously satisfied with the paste and scissors method of design, however nearly he may approach it in actual practice. Even those who are least generously endowed by nature, or most conscious of their own deficiencies, feel that they have something within themselves, which it would be a satisfaction to them to put into their work. Originality is a wide and vague term, but at least, it conveys to most of us an idea sufficiently definite to admit of our aiming at it, and that it should be invariably made our object I do not doubt.

There seems to me absolutely nothing of real nterest in a work which is simply free from solecisms and mistakes, in which all the virtues are negative, which is devoid of character and life in much the same way as the typical head which is produced by photographing one over another—where every feature is the mean between a variety of extremes. It is better to have fought and lost than never to have fought at all: it is better, vulgarly speaking, to have come an artistic cropper on one's own account, than to have skated about all one's life on the architectural ice leaning on the chair of convention.

I believe then that an independent and self reliant attitude should be a condition precedent to all design, but I deprecate the encouragement of purely visionary aspirations for novelty. Only the other day I read in what should have been a sober publication, as it was an official one, a warm commendation by one Frenchman of the following rhapsody by another—M. Vitet. "Never," says the latter, "never in the world has an Art been produced twice in the same guise; or, if it has, it was a mere trade the second time, and not an Art. Honour to those who, even in our own day, do not despair of inventing a new architecture. . . . Let them draw their inspiration, neither from the forms of antiquity, nor yet from those of the middle ages, but let them be impregnated with the sentiment of a master-thought—the thought of an artist, not an archæologist."

There is a great fallacy in this aspiration to start with, and one which has been exposed before now, and that is the assumption that the intellects of a new cycle must always approach a problem from a new point of view. The real truth is that the same class of mind in any age will always approach a problem in the same way and arrive at kindred results. Signal novelties in thought*, we are told, are as limited as signal inventions in architectural construction, and *vice versâ*. The Rousseau of the Social Contract and Emilius was, to take one example, in close touch with the Spartan Lycurgus, or with the society which that name represents; his nature led him to approach a problem which he believed to be identical in a way which was identical actually. Classification, in a word, should not be made according to dates, but according to the nature of the thinkers, for that there should be a recurrence of ideas in similarly constituted thinking machines, is at once natural and the fact. Again, to tell one to lay violent hands on a master-thought, unless it is some one else's, is about as reasonable as to tell one to inherit £10,000 a year, or to suggest that one should become Archbishop of Canterbury; master-thoughts are not so easily come by, and still less if the master-thoughts of past generations are to be a dead letter to us; we must all too have been archæologists in our degree or we shall find when we sit down to the desk that the teeming visions of an exalted fancy are all too ethereal for the sober process of transmission to drawing paper.

In saying that the meaning of originality is generally understood, I am not blind to the various glosses which ignorance or self-conceit put upon it, nor in suggesting it as an aim do I mean that the young designer is to set it up consciously as a thing to be won. Originality is a subtle quality, a fresh and natural sense of fitness, which bears no forcing, which to strain after is to put beyond reach. It cannot exist in the design unless it has existed first in the designer, because it is in its real nature an unconscious expression of the artist's own personality; a form of self-realisation—his way of viewing a thing, his way of seeing the possibilities and meeting the necessities of a given case, and no one else's. Nature breaks the mould, as has often been said, when she forms the man: individuals may approach or touch each other at points, but never all along the line. Each is an original piece of work himself, and his natural product cannot be less so; unfortunately for us it is very easy to go the wrong way to work, and to dam up the flow of our natural tendencies, or to carry them into an artificial channel is the simplest thing in the world. This conscious craving to do something fresh, as formulated by M. Vitet, is almost fatal in itself, and the very air we breathe nowadays teaches us to be self-conscious and introspective: for better or worse, and mainly for worse, we have eaten of the tree of knowledge of good and evil, and the charms of innocence and simplicity are not naturally inherent in anything we produce. Stendhal's autobiography or Marie Bashkirtscheff's diary are only extreme instances of a common complaint, and nothing opens the eyes more thoroughly to the difference between the conditions which govern our work and those under which the masterpieces of our great predecessors were produced than the comparison of such morbid outpourings as these with the breezy simplicity of Cellini's life of himself.

If any proof were wanted of the need of an intimate conversance with old work, it would be found, I think, in the aid which it gives to facility in production. so that it is half unconscious: the tools, at least, are all to the craftsman's hand, and the thread of inspiration is not broken by petty interruptions. I do not like to think of limiting the scope of study in any way, but at the same time it seems clear that a man has been both better endowed by nature, and will be actually better equipped, whose preferences lead him to put definite bounds to the sphere of anything like exhaustive inquiry. In this connection I make no apology for quoting from an essay by Mr. John Morley on "Literature," because literature is one of the fine arts, and the same critical faculty, if not the same productive, is concerned whether architecture or English prose are in question. Mr. Morley has been speaking of the lists of the best one hundred books with which we were flooded a few years ago, and he says: "To fill a man with heterogeneous scraps, from the Mahabharata and the Sheking down to 'Pickwick' and White's 'Selborne' may pass the time, but I cannot see how it would strengthen, instruct, or delight. . . . The steady working down of these lists would end in the manufacture of a prig." Now, as Mr. Morley goes on to say, "a prig has been defined as an animal which has been over-fed for its size." Priggishness in design is only too real a thing, and it is always marked by exaggerated self-consciousness; but I do not go so far as to say that it is inevitable, even where the designer, like a quick-change artist, appears constantly in a fresh character. It is only a shocking possibility.

Before leaving Mr. Morley, I am tempted to make a further quotation, or series of quotations, which contain a truth quite as real for us as for the audience to whom they were addressed. "I have an unbounded faith," he says, "in the virtue of cultivating direct and precise expression. It is not everybody who can command the mighty rhythm of the greatest masters of human speech, but everyone can make reasonably sure of what he means, and whether he had found the right word. . . . It has been said a million times that the foundation of right expression in speech or writing is sincerity. . . . Right expression is a part of character . . ." And again, "Truth is quiet; moderation and judgment are, for most purposes, more than the flash and glitter even of genius." I wish this were more generally recognised by the world at large for whom we have to cater. When we hear work qualified as original should we be right in assuming that it has been conceived and carried out in the spirit which Mr. Morley inculcates, or must we not rather confess to a conviction, born of long experience, that oddity is meant rather than originality, rhodomontade rather than direct expression? Some would say that in the appreciation of the public lies the justification for such work as this. I don't know whether one would naturally go to Addison for an opinion as to the principles which should govern Art, but he had a judicial way of laying down the law on general questions, and this is what he says on the point: "I shall add no more than that music, architecture, and painting, as well as poetry and oratory, are to deduce their laws and rules from the general sense of mankind, and not from the principles of those Arts themselves; or, in other words, the taste is not to conform to the Art, but the Art to the taste." Of course, it is obvious that the fundamental principles of Art were evolved by taste and have their basis in it, but not in that of the man in the street. Addison's language is not perfectly clear, but if he meant that the general direction of uncultivated likes and dislikes, at any given moment, is the proper criterion of what is radically good and bad, it is impossible to agree with him, nor does it appear that he contemplated the interference of the public in his own special domain. Mr. Louis Stevenson, writing of the fine arts generally, does, indeed, say that their *raisvn d'être* is to please the world at large, and that we have no business to try and make our customers buy wares they do not want, but he goes on to expatiate on the intrinsic faculty of the artist's work for conferring happiness on its creator, quite apart from any question of success. "In the wages of the life" he says, "not the wages of the trade, lies the reward," and again, "Man's (*i.e.* the artist's) joy may consist with perpetual failure and find exercise in continued chase." Of the pleasure which his own work gives him he has spoken more than once; the public has the good taste to agree with him, but had it been otherwise, I, for one, decline to believe that he would have condescended to exchange his own reading of his art for a more ample measure of popularity.

To advise the young man to ignore altogether the necessity of getting his bread and cheese is, however, to offer a counsel of perfection. The unflinching prophet of a higher taste or purer aims runs a greater risk of being left crying in the wilderness. Still the heretic of to-day may be canonised to-morrow; how often, indeed, has it happened that the laughing-stock of one generation has become the idol of the next! Magna est veritas et prevalebit, but it is a question of time. "The books," says Lecky, "which have proved of the most enduring value, have

* J. Morley.

usually at first been only appreciated by a very few, and have only emerged into notoriety" as he oddly puts it, "after many years of eclipse." He continues in the following pregnant words, "There are demagogues in literature as well as in politics; and there is a degradation of style, springing from a thirst for popularity, which is at least as bad as the pedantry of scholars." It is quite true, then, that what the mature judgment of the world ultimately approves is really great; this is the ultimate test: the prophet takes a higher place than the demagogue in the long run, for in this case second thoughts are best and most permanent, and the craze of the moment rarely deserves anything better than the oblivion which is in store for it.

Many a young designer has been infected by the spirit of Impressionism which is in the air. Amid many signs of talent and imaginativeness there is in the Impressionist school too obvious an addition to novelty of effect for its own sake, though its hideousness may make it quite unworthy of reproduction: Flesh may look dirty to blackness under certain conditions, but there is no reason for so painting it. Still here is work done on principle, with good intentions, and often with great suggestiveness, and we have no real right to quarrel with it. Speaking of Impressionism I am reminded of an instance, I am afraid somewhat beyond my subject, in which the principle was carried beyond drawing and design into execution and in an odd way. The work in question was one of great charm, but I felt the presence of a great blot when my attention was arrested by odd and purposeless patches of brickwork and tiles spotted about, sometimes in wavy courses, on the general background of stone. At first I thought it a somewhat absurd affectation of taking any materials which were available at the moment, building from hand to mouth, so to speak, but afterwards I inclined to the idea that it had been done with the object of getting that indistinct and indeterminate effect so well conveyed in the clever draughtsmanship of to-day—which, as a matter of fact, a wall face does present, owing to the limitations of the human eye. The good sketcher only shows that he is, as fond mothers say of their children, "very noticing"; he is repeating a lesson which he has been alert enough to learn from Nature. But the architect here tried to work back again from the reproduction, as if Nature did not know her own business, and the result was to rivet the eye at once with an oddity, and to make one lament that a charming piece of work should be marred by a restless and conscious endeavour to be clever.

But if there are some who fly to excess on principle, there are others whose proceedings have not that excuse, who argue, seemingly, that as isolation is possible in the midst of a crowd, so it is possible to be original in company, to be somebody else and yet yourself, but I think that those who "convey" a startling feature, or a reminiscence of one from somebody else's work, with a vague idea that in thus showing their appreciativeness they participate to some extent in the credit of a piece of design, to which none may have been due in the first instance, become, as it were, accessories after the fact, simply pile Pelion upon Ossa in the reduplication of mistakes; the step from originality, misunderstood to a veiled plagiarism, may not be exactly that from the sublime to the ridiculous, but the pettiness and absurdity of the latter is incontestable. Nothing is more contagious, nothing more difficult to throw off, than this diseased itching for effect, a malady which even blinds the patient to the passing of that critical moment when what he fondly believes to be new has already become stale.

Its popularity is one of the baits which such work holds out; its comparative easiness is another. "To be intelligible," says our latter-day La Bruyère, Mr. Oscar Wilde, "is to be found out," but to be unintelligible is either to have no meaning, or to be unable to express it. It has been well said that it is easier to be odd and enigmatical than to be sensible and simple.* It does not take much to collect a little gaping crowd in the street, nor is much thought nor much imaginative power requisite to provoke the attention of a people which is attracted by novelty, however crude. Before the young sailor launches his bark on the sea of architecture he must fill his ears with wax, or the soft tones of the siren of copyism will wheedle him to artistic destruction, and the more easily that he is not completely conscious of the danger he runs.

It ought to be enough to ask ourselves whether eccentricity has ever been a feature of any masterpiece, to avoid it like poison. In the whole sphere of Art, is the finest work ever marked by that oddity which, like a joke, becomes positively wearisome directly it is familiar? Has it not rather something of the measured cadence and stately rhythm of one of Burke's periods let us say? The test of a work's merit is the degree to which it will bear living with. There is a brilliancy in decay and degradation, like the lights of a festering marshland; it leads it followers into strange and fatal paths, like a will-o'-the-wisp, but the spell is soon broken. Rococo work of any kind is like the bright talker, the paradox-monger, for ever on stilts, whom to meet is, after a little experience, to avoid: the quips and cranks of such work, the pieces of wayward cleverness, like the sharp sayings of a naughty child, which amuse us in spite of ourselves, the conceits in which the designers displayed what Poe calls "the mad pride of intellectuality," are just what make it turn to ashes in the mouth.*

* A. Birrell

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

INSTITUTE OF CHARTERED ACCOUNTANTS.

THE new buildings in Coleman-buildings, Moorgate-street, now being completed for the Institute of Chartered Accounts, were inspected on the afternoon of Saturday, February 24, by a large number of members of the Architectural Association on the occason of the second Spring visit. The party were conducted over the building by the architect, Mr. J. Belcher, and Mr. F. T. W. Goldsmith, the junior honorary secretary.

This building has become well known through being illustrated in this journal and the Academy exhibition. There are two elevations visible to the west and south, and these are executed in Portland stone with elaborate detail. The style adopted is both late and free, and much variety is observable in the details of every part. Great character is given to the building by the free use of sculpture, in which the architect obtained the valuable co-operation of Mr. Hamo Thornycroft, R.A., and Mr. Harry Bates, A.R.A. It is to be regretted that, for economical reasons, really good sculpture is rarely used in any quantity on London buildings. This, however, is a pleasing exception, and deserves a site where it can be observed with greater ease than in its present position. Closely encompassed by high buildings, it is impossible to get a good view of the building except at a very sharp angle. Mr. Thornycroft's work is represented by a deep frieze or set of panels placed between the three-quarter columns which support the enriched cornice terminating the façade. These panels, four or five feet in height, contain three or four figures representative of the arts, the crafts, mining, and other departments of commerce, in the existence and failure of which the labours of a chartered accountant are required. Mr. Thornycroft also contributes a figure of Justice blindfold, which terminates the projecting angle bay, which Mr. Belcher has cleverly introduced to mask the canted angle, upon which the County Council insist. Mr. Harry Bates's work is represented by the admirably-carved Caryatides above the ground floor, whilst the subsidiary carving is by Messrs. Farmer & Brindley. The interior of the building has been kept fairly plain with the exception of the reading-room and library with the council chamber over, and the work owes much of its charm to the excellence of proportion with which the architect has invested it.

The ground floor has the library on the left of the main entrance, whilst on the right four offices for letting are placed with a separate entrance from the side street. This new entrance gives access, by separate staircase, to the examination hall on the third floor, and the Institute's offices, secretary's room, waiting and committee rooms on the first floor. These rooms are also served by the principal staircase from the entrance hall, which gives an imposing approach to the council chamber on the first floor.

Illustrations of this building have appeared in our issues for January 12, 1889, August 27, 1892, and January 7, 1893.

The building has been admirably built by Messrs. Colls & Sons, of Coleman-street, E.C. Mr. G. Smith acted as clerk of the works.

* The remainder of Mr. Street's paper, together with some notes of the discussion, in our next.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION (LONDON).—The eighth meeting of the Discussion Section of this Association for the present session was held at the rooms of the Association on Wednesday evening last. The Chairman, Mr. S. B. Beale, presided. After the discussion of a practical difficulty, encountered in his practice by one of the members, on the treatment of provisional amounts in quantities, Mr. Alfred H. Clark, A.R.I.B.A., read a paper on "Town Houses." A discussion ensued, which was opened by the senior secretary, Mr. W. Henry White, and the subject was summed up by the Special Visitor, Mr. Francis Hooper.

ARCHITECTURAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY.—The Architectural section of the Glasgow Philosophical Society met on Monday last in the rooms, 207, Bath-street—Mr. Campbell Douglas presiding. Mr. T. Crichton Fulton, electrical engineer, Glasgow, read a paper on "The Economies of Electric Lighting and Power Transmission." Of all prime movers for generating electricity, he said, a water turbine, if there was a convenient and plentiful supply of water, was the most inexpensive and economical. It was clean, compact, steady, and very easily controlled. Energy in the form of water could be more economically transmitted than in any other way. In discussing the question of electric lighting, Mr. Fulton said that though perhaps the actual outlay would exceed that paid for a similar amount of light obtained directly from gas, yet, when one considered that electric light was safer, healthier, and steadier, and that it did not consume any oxygen nor vitiate the atmosphere, it would be found in the long run to be much more economical. The paper was illustrated by various experiments and lantern-slides.

LIVERPOOL ARCHITECTURAL SOCIETY.—On Monday last, at a special meeting of the Liverpool Architectural Society, held at the Library, 15, Cable-street, a paper was read by Mr. Herbert Rimmer (Soane medallist), entitled "Renaissance Architecture of Spain," illustrated by sketches and photographs taken during Mr. Rimmer's recent tour as Soane Student of the Royal Institute of British Architects.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A special meeting of the Edinburgh Architectural Association was held on the 22nd ult. in the Royal Institution, Princes-street, Edinburgh, for the purpose of discussing the paper on "Our Duty in Respect of Ancient Buildings," read at a previous meeting by Mr. W. W. Robertson, H.M. Board of Works, President of the Association. The chair was occupied by Mr. Robertson. In his paper Mr. Robertson had said he did not believe there was a single building restored during the first fifty or sixty years of this century, which would not call forth an almost unanimous verdict to the effect that it had suffered great and irreparable injury in the process. He pleaded for the careful preservation of our old buildings, and above all for their preservation from "restoration," and he maintained that restoration was only admissible where there was no possibility of its involving destruction. The discussion was opened by Dr. R. Rowand Anderson, who contended that they were not entitled to stop the history of a building, say, at the "Perpendicular" period or any other period. The history should be allowed to go on, and the fittings and furniture that marked these periods should be allowed to remain. A building was a thing to be used, and their life and comfort depended upon keeping it in a state of repair, and that implied changes more or less from time to time as their views on comfort and civilization changed. If buildings were to be restored for the simple purpose of showing the original design, he was not prepared to condemn that view of restoration, but if a building was to be restored for use, he held that the architect, while jealously preserving all that was old, had to meet the purpose to which the building was to be devoted, even if thereby he had to depart from the original plan and make additions that did not conform to the original style or design of the building. Mr. G. S. Aitken having spoken, Mr. H. Capper said that in the restoration of buildings they must consider each individual case. If the building was one of museum value, then by all means let it remain, but if it could be used they would be justified in making whatever alterations were considered necessary. Mr. Thomas Ross supported the views entertained by Dr. Anderson, and Mr. James Bruce dealt with national buildings put to use, referring specially to the Castle

Hall at Stirling. He held that to take such a noble building and turn it into barracks was not a use, but a misuse, and that in such a case what the country was bound to do was to restore that building to its original condition. Mr. Robertson, in replying to the discussion, maintained that the preservation of an ancient building, always supposing that it was worthy of preservation, should take precedence over every other consideration. With regard to restoration as a means of preservation he had not a single word to say against it. It was restoration of a different sort that he had tried to condemn most absolutely. If restoration was to be carried on with the main view of preserving everything that was valuable in the building, and if that was put before everything else, he thought that such restoration was in every way desirable.—On the 25th ult. the members visited the S.S.C. Library, and the M'Ewan Hall, being shown over the former by Mr. James B. Dunn, and over the latter by Dr. Rowand Anderson. A description of the M'Ewan Hall will be found on another page, under the heading "General Building News."

GLASGOW ARCHITECTURAL ASSOCIATION.—On the 21st ult. a lecture was delivered before the Glasgow Architectural Association, by Mr. S. Henbest Capper, M.A., A.R.I.B.A., Edinburgh, the subject being "Architecture and the teaching of history, with special reference to Old Edinburgh." By way of introduction, the lecturer referred to the close relation existing between architecture and history, and illustrated the subject by means of a large number of lantern views of old work in Edinburgh, noticing more especially the Castle buildings, the Abbey and Palace of Holyrood, St. Giles's Cathedral, and in each instance he alluded to the historical associations which have gathered round the remains, with an account of the various points of interest to the architect and antiquarian. At the close a hearty vote of thanks was awarded the lecturer.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon at Spring-gardens, the Chairman, Mr. John Hutton, presiding.

Tenders.—Tenders were received for the erection of a chrysanthemum-house in Finsbury Park, and for the erection of public conveniences, cart-shed, and bothy at the Ladywell Recreation Ground, Lewisham. The lists will be found in another part of this number of the *Builder*.

The Markets Question.—The discussion of this question, arising out of the recommendations of the Report of the Public Control Committee (see *Builder*, p. 153, *ante*), was resumed. The recommendations referring to the proposed establishment of retail markets were, after a debate of some length, referred back to the Committee for further consideration.

The Contract for the New Woolwich Ferry-boat.—A long discussion arose out of a recommendation of the Bridges Committee as to the contract for the new ferry-boat required at Woolwich. On October 25 last, Messrs. Wm. Simons & Co., of Renfrew, sent in the lowest tender (amounting to £15,800) for the construction of a Woolwich ferry-boat. From correspondence submitted by the Committee, it appeared that the firm intimated that while they had "filled in the rate of wages of labour in Schedule III. that are presently in force, these may vary according to the state of trade, and arrangements which may be made with trade unions in the Clyde district during the construction of the vessel." Objection being made to this, the firm on January 31 consented to delete the words "the state of trade and." On February 2, the Committee wrote to say they could not agree to the proposed stipulation, inasmuch as it did not comply with the following resolution of the Council:

"That all contractors be compelled to sign a declaration that they pay the trades union rates of wages and observe the hours of labour and conditions recognised by the trades unions in the place or places where the contract is executed, and that the hours and wages be inserted in and form part of the contract by way of schedule, aad that penalties be enforced for any breach of agreement."

The Committee now reported that it was not competent for them to proceed with the tender of Messrs. Simons in consequence of the words they proposed to add being in direct contravention of the standing order of the Council. They therefore recommended—

"That the Bridges Committee be authorised to reconsider the tenders sent in for the construction of the ferry boat, with a view to recommending one for acceptance by the Council."

Mr. Torrance moved, and Dr. Collins seconded, the following amendment:—

"That the Council, having considered the correspondence between the Bridges Committee and Messrs. Simons & Co., instructs the Bridges Committee to complete the contract with the condition attached by Messrs. Simons."

After a long debate, the amendment was carried, on a division, by 67 votes to 39.

A motion to refer the matter back for further consideration and report was rejected, on a show of hands, by a large majority.

Rates of Wages and Hours of Labour.—The Works and Stores Committee presented a report containing a first list of certain trades, with the trade union rates of wages and hours of labour, applicable to works carried out by the Council, and in doing so he announced that the first "job"—the erection of a fire station—undertaken by the Committee would be put in hand on the following day. We will give an analysis of this report in our next.

Proposed New Fire Brigade Stations.—The Fire Brigade Committee recommended that the Council should agree to purchase from the Corporation of London, for the sum of 16,000*l.*, the freehold of the site fronting John Carpenter-street (at the rear of Sion College), in order that a fire station might be erected thereon. The Committee also recommended that, with a view to the erection of a Shoreditch fire station in substitution to the existing one in Old-street, the freehold should be acquired of the vacant piece of land fronting Tabernacle-square and of the premises No. 61, Paul-street, and No. 104, Tabernacle-walk, at the rear thereof. The consideration of these recommendations was adjourned.

Artisans' Dwellings.—The Public Health and Housing Committee brought up a long report with reference to the course to be pursued in relation to the erection of working-class dwellings. They submitted the following recommendation:—

"That the rents to be charged for dwellings erected by the Council shall not exceed those ruling in the neighbourhood, and shall be so fixed as to provide a net return of not less than 3 per cent., after allowing for a sinking fund for rebuilding and all outgoings, upon the value of the land, subject to the obligation to erect dwellings upon it, plus the cost of building with ordinary foundations, and that all such dwellings shall be so designed that the cost of erection may not exceed a sum which will enable the Council to carry out the foregoing conditions."

The consideration of the report was postponed. After transacting some other business, the Council adjourned.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION:

ANNUAL MEETING.

THE twenty-sixth annual general meeting of this Institution (and the election of one pensioner), took place on Tuesday evening last at the offices, 21, New Bridge-street, E.C. Mr. Wm. A. Colls (Messrs. Colls & Sons) in the chair, supported by Mr. Colin G. Patrick (retiring President), Mr. Edwin Brooks (Treasurer), and by Messrs. C. C. Roe, C. K. Turpin, J. A. Robson, T. H. Winny, F. S. Oldham, W. D. Gilbert, and other gentlemen. Letters regretting non-attendance were read from Messrs. G. S. Pritchard (Trustee), Mr. H. W. Parker, E. B. Gammon, and others.

The report stated that the total income for the past year amounted to 686*l.* 0s. 9d. (265*l.* 13s. of this sum being annual subscriptions, 299*l.* 18s. donations. 114*l.* 2s. 4d. dividends, 1*l.* 11s. 2d. interest on deposit account, and a balance of 4*l.* 16s. 3d. from dinner account). The expenditure was 445*l.* 18s. 5d. (including 337*l.* 10s. paid for pensions, and 20*l.* for temporary relief cases. Three pensioners were elected during the year. There are now seventeen pensioners on the books, the total elected since the foundation being 35. There is now a vacancy for a builder's clerk's orphan at the Orphan Working School, and the Committee are prepared to receive applications on behalf of children whose friends may wish to place them in nomination for the same. The fourteenth annual dinner was held on March 30, 1892, at the Holborn Restaurant, Mr. Colin G. Patrick presiding, when the sum of 314*l.* 12s. was announced in response to his earnest appeal. The amount of Stock held by the Institution is now 4,150*l.*, but the Committee greatly desire that this sum should be substantially increased with a view to obtaining a larger income from this reliable source. The report concluded by thanking Mr. Patrick for his practical services in promoting the welfare of the Institution, and acknowledging the support rendered by the master builders, architects, and merchants connected with the building trade.

The President-elect, in moving the adoption of the report, said that although he had met with a slight mishap which made him rather lame, he was yet delighted to be present, and to thank the committee for the honour they had done him in inviting him to become President. He hoped that he should have a successful year. In looking over the accounts, he was struck with the small amount expended in the management, but there was, however, another point which it seemed to him would bear improvement; he alluded to the comparatively small number of clerks who at present subscribed, and he hoped to devote some attention to this matter, with a view to getting a larger number to assist the funds. He concluded by saying he hoped to work well for the Institution, and would propose the first resolution, "That the report and balance-sheet, as read, be adopted and printed, together with the list of subscribers and rules of the Institution."

Mr. C. K. Turpin seconded the motion, which was put and carried unanimously.

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Mr. Patrick, in acknowledging the vote of thanks, referred to the help he had had from the committee. With reference to Mr. W. Colls, the new President, he had known him a long time, and was able to assure him that, in taking up the duties, he would find no trouble at all.

The officers for the ensuing year were then elected, after which Mrs. Martha Marcham was elected to the widow's pension of 20*l.* per annum.

The proceedings closed with the usual vote of thanks to the chairman.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS:

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THE annual dinner of the donors, subscribers, members, and friends of this Institution was held in the Venetian Saloon of the Holborn Restaurant on Saturday evening, February 25, Mr. Thomas F. Rider, F.R.G.S., presiding, and 349 sat down to table. Before proceeding with the toasts, the Chairman said he regretted to announce that the esteemed Governor of the Institution (Mr. George Plucknett, J.P.) was unable to attend, being confined to his house by an attack of gout. He also regretted to announce that Mr. John Burt was unexpectedly prevented from being present.

The loyal toasts having been duly honoured, the Chairman proposed the toast of the evening, "Success to the Provident Institution of Builders' Foremen and Clerks of Works." It was scarcely necessary to say anything in support of so excellent an Institution as that. It had been so long established, was so well known, and was so carefully administered, that it spoke for itself. The Institution was a model to all others, for the economy with which it was conducted. It was a provident institution in the very best sense of the term, because every one who was himself helped by it had embraced the principle of self-help, and must have been a member of the Institution for three years before he would have any claim upon its funds. The master-builders owed a deep debt of gratitude to their foremen. As to the clerks of works, they were also a highly intelligent and able body of men, having important duties to fulfil. He quite agreed with a remark made by one of the speakers at the recent dinner of the Clerks of Works' Association—that a clerk of works should be something more than an architect's watch-dog. Given a respectable and a responsible builder, and given a foreman who was desirous, as all foreman ought to be, of doing his duty honestly and faithfully, there ought to be thorough harmony between clerk of works and foreman, and between architect and builder. In conclusion, Mr. Rider made some humorous remarks with reference to the proceedings of the County Council, and gave the toast "The Provident Institution of Builders' Foremen and Clerks of Works," coupled with the name of Mr. F. T. W. Bedford, the secretary.

Mr. Bedford, in replying, said that the Institution had now reached a rather critical age, for it had just turned its fiftieth year. Although its present appearance was very different from that which it presented fifty years ago, it was, happily, in a flourishing condition. During its existence the Institution had afforded relief in the shape of pensions to twenty-seven builders' foremen and clerks of works, and forty-three widows had received pensions. The sum of 7,987*l.* had been expended on pensions, and 1,600*l.* in temporary relief. They now spent between 200*l.* and 300*l.* a year in pensions.

Mr. G. Groome proposed "The Governor, Trustees, Donors, Honorary Subscribers, and Visitors." They all regretted the absence of Mr. Plucknett, the Governor, but he had much pleasure in coupling with the toast the name of Mr. F. J. Dove, one of the trustees.

Mr. Dove having responded,

Mr. J. Howard Colls, in felicitous terms, proposed "The Architects, Engineers, and Surveyors."

Mr. E. B. I'Anson responded for "The Architects," and Mr. W. Strudwick for "The Surveyors."

Mr. Stapleton proposed "The Builders," coupled with the name of Mr. Collins, who, in replying at some length, referred to the relations which ought to subsist between masters and men.

Other toasts followed, including "The Chairman." During the evening subsciptions and donations to the amount of 112*l.* were announced; and since the dinner the Chairman has received 13*l.* 13s. more (including 10*l.* 10s. from the Builders' Institute), making a total of 125*l.*

Correspondence.

To the Editor of THE BUILDER.

M. CORROYER'S THEORY OF THE GOTHIC VAULT.

SIR,—M. Corroyer, in his book of 1892, on "Gothic Architecture," tells us that Gothic groining had its origin in the domed churches of Aquitaine, of which St. Front, at Perigueux, was the first example.

This opinion of his is not an idea that has suddenly struck him, but was mentioned in his book on "Romanesque Architecture," published in 1888.

In chapter xii. of the second part of the treatise of 1888, he says, "The pendentives of the cupolas of St. Front, worked normally to the curve in passing from the square plan of the springing of the arches to the circular plan crowning their key stones, are the embryoes of the pointed arch (*l'arc ogif*) or pointed groins (*croisée d'ogives*), according to the very ancient expression and which was still employed in the time of Philibert de L'Orme to describe the diagonal ribs (*arcs diagonaux*) supporting the vaults with the aid of the transverse ribs (*arcs-doubleaux*)."

M. Corroyer then goes on to show that the church of St. Vit the Elder, vaulted with three domes, has on the soffit of each dome eight ribs, the diagonal ribs running down to the starting point of the pendentives; and remarks that it has been stated, though not proved, that these cupolas were built, then pulled down and replaced by the vaults that now exist. He also shows a section of a similar dome with ribs at the Church of Saumur, on the Loire; and, in confirmation of his argument, he points to the domical shape the early groined vaults took, and to the bays being still kept square, when the domes were abandoned and groined vaulting substituted for them.

M. Corroyer has, no doubt, satisfied himself that his theory is right, but he has hardly made his theory more than probable to ordinary readers; and has certainly not made it as unassailable by adverse criticism as a proposition of Euclid.

The architectural profession ought to be, and probably is, grateful to him for his admirable book on Romanesque architecture. The author has certainly contributed his time, and probably his leisure and substance, for the benevolent purpose of enlightening his fellows. Still I respectfully suggest that, if M. Corroyer has the time and inclination, he would add to the debt of gratitude we owe him, by publishing a pamphlet to completely establish his theory.

G. AITCHISON.

*** We presume that Mr. Aitchison's letter was partly called forth by some remarks in our review of M. Corroyer's "Gothic Architecture" the other day. Since receiving it we have referred to M. Corroyer's work on "Romanesque Architecture," in which we observe that he gives a section of the domed roof at Fontevrault, which he dates 1101–1120, and which is a plain dome, and compares with it a section of the nearly similar roof at Saumur, in which the surface of the dome is divided by four ribs, and he seems to argue that this rib treatment shows the development of the ribbed vault from the domical roof. It seems to us that it may very well be the other way about, and that the appearance of the rib was the influence of the northern Gothic vaulting form making itself felt on the domed roof. But there is another question which we should like to ask—not of M. Corroyer, for we know that no French architect will either take the trouble to visit England to inspect our architectural monuments,* or accept any statement about them which does not square with his own theories; but we should like to ask our learned friend, Professor Aitchison, if he accepts M. Corroyer's view that Gothic vaulting was developed from the dome churches of the South of France, how does he account for the fact that cross-vaults on the Roman pattern were being built in the aisles of Durham and Norwich, at or probably *before* the date given by M. Corroyer to the Fontevrault roof?—ED.

* The late M. Ruprich-Robert is the only important exception we remember.

THE ORIENTATION OF CHURCHES.

SIR,—I think I can answer "H. E. T.'s" inquiry in your issue of February 18 (page 135), as to where Wordsworth got his information from. At the sale of the poet's books my father purchased a volume, bearing Wordsworth's name, and in which, on page 123, the following passage is underscored with red ink: "This Churche [St. Mary's, York] lyeth towards ye North Eeste bye North, for on Sancte Marie's Day ye Sonne thus ryseth." This quotation partly, at least, accounts for Wordsworth's note. The book is "Bartram's Travels of a City Gentelmanne thorough the Shire of Yorke." (London, 1799. No publisher's name.)

JAMES ARDENSTONE.

"BURR *v.* RIDOUT."

SIR,—Referring to the article which appeared in your issue of the 25th inst. on this case, and your note as to the defendant's obligation to expend 4,000*l.*, perhaps you will allow me to explain that under his agreement with the ground landlord the defendant was not bound to build at the nett cost of 4,000*l.*, but to erect buildings "of the total value of 4,000*l.*" This does not appear very clearly in the report of the case, but I need not point out to your readers the difference in these contracts.

J. A. COLLINS,
Defendant's Solicitor.

5, *New Inn, London, W.C.*,
February 28, 1893.

The Student's Column.

CHEMISTRY.—IX.

Coal and its Valuation.

COAL consists of the remains of vegetation which in the course of many thousands of years, and during many changes of nature, have become altered to their present form.

There are many varieties of coal, and it is by no means uncommon to meet with several kinds in the same mine. Roughly speaking, the value of a coal for heating purposes may be said to depend upon the amount of *fixed* carbon it contains, *i.e.*, the amount of carbon that is not driven off as gas when the coal is heated to redness without being allowed any contact with air or oxygen. For gas-making purposes the value of a coal may be said to depend upon the amount of *volatile* hydrocarbons it contains.

Thus *anthracite*, which contains a very large percentage of fixed carbon, is the best heating coal; but owing to the strong draught of air necessary to maintain it in a proper state of combustion, it is not suitable for use in the ordinary open grate. It is much used for closed stoves and for heating boilers, especially in America, where it is more abundant than in this country. Anthracite is a very hard, shiny coal which burns without flame, and does not soil the fingers when handled.

Steam or smokeless coal somewhat resembles anthracite, but requires less draught to cause it to burn readily. It burns with more or less flame, and does not contain so much fixed carbon as anthracite.

Free-burning Coal.—Under this head may be included most of the numerous classes of house coal. It burns with much flame, and is softer than either anthracite or steam coal, but should not cake together. Much of this kind of coal comes from Yorkshire.

Caking or bituminous coal gives off large volumes of smoke, and cakes together a great deal. It burns with a bright flame. This variety of coal is largely employed for gas manufacture, and is obtained chiefly from Northumberland and Durham.

Cannel or candle coal is very rich in volatile hydrocarbons, and is much used for enriching gas obtained from the cheaper classes of coal. It has a dull, black colour, and a slaty fracture. This variety of coal is closely akin to the *parrot coal* of Scotland and to the *rattlers* of Yorkshire. The coke from this kind of coal is usually almost worthless on account of the large amount of mineral matter or ash it contains.

Lignite is of a brown colour, and is lighter than ordinary coal; it often possesses a fibrous character, and appears more closely akin to peat than to coal. It is, however, largely used as fuel in some parts of the world. In determining the value of coal it is important to know the amount of unburnable ash that it contains, and also, if it is sold by weight, the quantity of moisture or water in it. Thus, two samples of coal supplied for heating purposes yielded the following results:—

	Moisture.	Ash.	Fixed Carbon.
(1)	6·02	5·18	58·66
(2)	8·15	23·00	42·15

The first is a fairly good sample of coal, and contains only 1·2 cwt. of water and 1 cwt. of ash in the ton of coal; but the second contains 1·6 cwt. of water and 4·6 cwt. of ash in the 20 cwt. of coal, that is to say, considerably more than one quarter of the coal is worse than useless. These are by no means extraordinary samples; worse coals than the second are often palmed off upon the private consumer.

Coal Gas.

Coal gas is obtained by heating coal in retorts at a red heat. The coal is thus decomposed, the fixed carbon and ash remaining in the retort in the form of coke, while the hydrocarbons and other compounds escape in the form of gas up a vertical pipe called the ascension pipe and through a water-seal in the horizontal pipe called the hydraulic main. The gas passes along the hydraulic main into the condensers. Here the hydrocarbons that are liquid or solid at the ordinary temperatures of the air, condense out as tar. The gas then passes into some large towers filled with coke, through which a stream of cold water is constantly descending. The crude gas ascending through these towers, or "scrubbers" as they are called, parts with its ammonia and a considerable quantity of carbonic acid and sulphuretted hydrogen, all of which may be considered as impurities. The solution thus formed is known as "gas liquor," or "ammoniacal gas liquor." The gas next passes through very large iron boxes containing layers of lime, and sometimes also oxide of iron. In these purifiers the remainder of the carbonic acid and sulphuretted hydrogen is removed. Finally, the gas passes through a similar box containing layers of lime, which have previously been saturated with sulphuretted hydrogen. In this box, or "purifier," the bisulphide of carbon is absorbed. The gas is now ready for storing in the gas-holders. It is the spent material from the sulphide purifiers which sometimes constitutes a public nuisance by the evil odour it emits. The following are the most important commercial substances obtained indirectly or directly by the distillation of coal and coal-tar:—Coke, ammonia, ammonium salts, aniline dyes, saccharine, carbolic acid, naphthaline, naphtha, creosote, and benzol.

Oxides of Carbon.

Carbon forms two oxides, viz. (1) carbon monoxide, and (2) carbon dioxide, commonly called carbonic acid gas. Carbon monoxide or carbonic oxide, CO, is a colourless and very poisonous gas. It exists in large quantities in water gas, *i.e.*, gas made by decomposing steam by driving it through red hot coke or carbon, thus:—

$$H_2O + C = CO + H_2.$$

Carbonic oxide possesses neither smell nor taste, and is therefore all the more dangerous when present in odourless gas supplied for domestic purposes.

Carbon monoxide may be prepared by passing carbon dioxide over red-hot carbon,

$$CO_2 + C = 2CO.$$

In this manner, carbon monoxide is formed in an ordinary coke fire, where the carbon dioxide first formed in the lower part of the fire by the complete oxidation of the carbon by the oxygen of the air, by rising through a further layer of red-hot coke, is converted into carbon monoxide, and may be seen burning with a pale blue flame at the top of the fire.

When carbon monoxide burns it forms, of course, carbon dioxide, thus:—$CO + O = CO_2$.

The gas may also be prepared by heating carbon with a limited supply of air.

$$C + O = CO,$$

but is usually obtained by heating oxalic acid with strong sulphuric acid, because it is a more convenient method, and by it a purer product can be obtained.

The reaction which takes place may be expressed thus:—

$$C_2H_2O_4 = H_2O + CO + CO_2.$$

(oxalic acid.)

The sulphuric acid abstracts the water, and the carbon dioxide may be separated from the carbon monoxide by passing the mixture through a solution of caustic potash, or soda, which absorbs the carbon dioxide and allows the carbonic oxide to pass through it.

Carbon dioxide, or carbonic anhydride, CO_2, is a colourless gas, but possesses a faintly acid taste and smell. It is found in small quantities in the atmosphere. It is one of the products of the decay of organic substances, and is, therefore, found at the bottom of disused wells in which there is decomposing vegetation or other organic matter. It is evolved in large quantities by vol-

Hall at Stirling. He held that to take such a noble building and turn it into barracks was not a use, but a misuse, and that in such a case what the country was bound to do was to restore that building to its original condition. Mr. Robertson, in replying to the discussion, maintained that the preservation of an ancient building, always supposing that it was worthy of preservation, should take precedence over every other consideration. With regard to restoration as a means of preservation he had not a single word to say against it. It was restoration of a different sort that he had tried to condemn most absolutely. If restoration was to be carried on with the main view of preserving everything that was valuable in the building, and if that was put before everything else, he thought that such restoration was in every way desirable.—On the 25th ult. the members visited the S.S.C. Library, and the M'Ewan Hall, being shown over the former by Mr. James B. Dunn, and over the latter by Dr. Rowand Anderson. A description of the M'Ewan Hall will be found on another page, under the heading "General Building News."

GLASGOW ARCHITECTURAL ASSOCIATION.—On the 21st ult. a lecture was delivered before the Glasgow Architectural Association, by Mr. S. Henbest Capper, M.A., A.R.I.B.A., Edinburgh, the subject being "Architecture and the teaching of history, with special reference to Old Edinburgh." By way of introduction, the lecturer referred to the close relation existing between architecture and history, and illustrated the subject by means of a large number of lantern views of old work in Edinburgh, noticing more especially the Castle buildings, the Abbey and Palace of Holyrood, St. Giles's Cathedral, and in each instance he alluded to the historical associations which have gathered round the remains, with an account of the various points of interest to the architect and antiquarian. At the close a hearty vote of thanks was awarded the lecturer.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon at Spring-gardens, the Chairman, Mr. John Hutton, presiding.

Tenders.—Tenders were received for the erection of a chrysanthemum-house in Finsbury Park, and for the erection of public conveniences, cart-shed, and bothy at the Ladywell Recreation Ground, Lewisham. The lists will be found in another part of this number of the *Builder*.

The Markets Question.—The discussion of this question, arising out of the recommendations of the Report of the Public Control Committee (see *Builder*, p. 153, *ante*), was resumed. The recommendations referring to the proposed establishment of retail markets were, after a debate of some length, referred back to the Committee for further consideration.

The Contract for the New Woolwich Ferry-boat.—A long discussion arose out of a recommendation of the Bridges Committee as to the contract for the new ferry-boat required at Woolwich. On October 25 last, Messrs. Wm. Simons & Co., of Renfrew, sent in the lowest tender (amounting to £15,800) for the construction of a Woolwich ferry-boat. From correspondence submitted by the Committee, it appeared that the firm intimated that while they had "filled in the rate of wages of labour in Schedule III. that are presently in force, these may vary according to the state of trade, and arrangements which may be made with trade unions in the Clyde district during the construction of the vessel." Objection being made to this, the firm on January 31 consented to delete the words "the state of trade and." On February 2, the Committee wrote to say they could not agree to the proposed stipulation, inasmuch as it did not comply with the following resolution of the Council:

"That all contractors be compelled to sign a declaration that they pay the trades union rates of wages and observe the hours of labour and conditions recognised by the trades unions in the place or places where the contract is executed, and that the hours and wages be inserted in and form part of the contract by way of schedule, and that penalties be enforced for any breach of agreement."

The Committee now reported that it was not competent for them to proceed with the tender of Messrs. Simons in consequence of the words they proposed to add being in direct contravention of the standing order of the Council. They therefore recommended—

"That the Bridges Committee be authorised to reconsider the tenders sent in for the construction of the ferry boat, with a view to recommending one for acceptance by the Council."

Mr. Torrance moved, and Dr. Collins seconded, the following amendment:—

"That the Council, having considered the correspondence between the Bridges Committee and Messrs. Simons & Co., instructs the Bridges Committee to complete the contract with the condition attached by Messrs. Simons."

After a long debate, the amendment was carried, on a division, by 67 votes to 39.

A motion to refer the matter back for further consideration and report was rejected, on a show of hands, by a large majority.

Rates of Wages and Hours of Labour.—The Works and Stores Committee presented a report containing a first list of certain trades, with the trade union rates of wages and hours of labour, applicable to works carried out by the Council, and in doing so he announced that the first "job"—the erection of a fire station—undertaken by the Committee would be put in hand on the following day. We will give an analysis of this report in our next.

Proposed New Fire Brigade Stations.—The Fire Brigade Committee recommended that the Council should agree to purchase from the Corporation of London, for the sum of 16,000*l.*, the freehold of the site fronting John Carpenter-street (at the rear of Sion College), in order that a fire station might be erected thereon. The Committee also recommended that, with a view to the erection of a Shoreditch fire station in substitution to the existing one in Old-street, the freehold should be acquired of the vacant piece of land fronting Tabernacle-square and of the premises No. 61, Paul-street, and No. 104, Tabernacle-walk, at the rear thereof. The consideration of these recommendations was adjourned.

Artisans' Dwellings.—The Public Health and Housing Committee brought up a long report with reference to the course to be pursued in relation to the erection of working-class dwellings. They submitted the following recommendation:—

"That the rents to be charged for dwellings erected by the Council shall not exceed those ruling in the neighbourhood, and shall be so fixed as to provide a net return of not less than 3 per cent., after allowing for a sinking fund for rebuilding and all outgoings, upon the value of the land, subject to the obligation to erect dwellings upon it, plus the cost of building with ordinary foundations, and that all such dwellings shall be so designed that the cost of erection may not exceed a sum which will enable the Council to carry out the foregoing conditions."

The consideration of the report was postponed. After transacting some other business, the Council adjourned.

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The loyal toasts having been duly honoured, the Chairman proposed the toast of the evening, "Success to the Provident Institution of Builders' Foremen and Clerks of Works." It was scarcely necessary to say anything in support of so excellent an Institution as that. It had been so long established, was so well known, and was so carefully administered, that it spoke for itself. The Institution was a model to all others, for the economy with which it was conducted. It was a provident institution in the very best sense of the term, because every one who was himself helped by it had embraced the principle of self-help, and must have been a member of the Institution for three years before he would have any claim upon its funds. The master-builders owed a deep debt of gratitude to their foremen. As to the clerks of works, they were also a highly intelligent and able body of men, having important duties to fulfil. He quite agreed with a remark made by one of the speakers at the recent dinner of the Clerks of Works' Association—that a clerk of works should be something more than an architect's watch-dog. Given a respectable and a responsible builder, and given a foreman who was desirous, as all foreman ought to be, of doing his duty honestly and faithfully, there ought to be thorough harmony between clerk of works and foreman, and between architect and builder. In conclusion, Mr. Rider made some humorous remarks with reference to the proceedings of the County Council, and gave the toast "The Provident Institution of Builders' Foremen and Clerks of Works," coupled with the name of Mr. F. T. W. Bedford, the secretary.

Mr. Bedford, in replying, said that the Institution had now reached a rather critical age, for it had just turned its fiftieth year. Although its present appearance was very different from that which it presented fifty years ago, it was, happily, in a flourishing condition. During its existence the Institution had afforded relief in the shape of pensions to twenty-seven builders' foremen and clerks of works, and forty-three widows had received pensions. The sum of 7,987*l.* had been expended on pensions, and 1,600*l.* in temporary relief. They now spent between 200*l.* and 300*l.* a year in pensions.

Mr. G. Groome proposed "The Governor, Trustees, Donors, Honorary Subscribers, and Visitors." They all regretted the absence of Mr. Plucknett, the Governor, but he had much pleasure in coupling with the toast the name of Mr. F. J. Dove, one of the trustees.

Mr. Dove having responded,

Mr. J. Howard Colls, in felicitous terms, proposed "The Architects, Engineers, and Surveyors."

Mr. E. B. I'Anson responded for "The Architects," and Mr. W. Strudwick for "The Surveyors."

Mr. Stapleton proposed "The Builders," coupled with the name of Mr. Collins, who, in replying at some length, referred to the relations which ought to subsist between masters and men.

Other toasts followed, including "The Chairman." During the evening subsciptions and donations to the amount of 112*l.* were announced; and since the dinner the Chairman has received 13*l.* 13s. more (including 10*l.* 10s. from the Builders' Institute), making a total of 125*l.*

Correspondence.

To the Editor of THE BUILDER.

M. CORROYER'S THEORY OF THE GOTHIC VAULT.

SIR,—M. Corroyer, in his book of 1892, on "Gothic Architecture," tells us that Gothic groining had its origin in the domed churches of Aquitaine, of which St. Front, at Perigueux, was the first example.

This opinion of his is not an idea that has suddenly struck him, but was mentioned in his book on "Romanesque Architecture," published in 1888.

In chapter xii. of the second part of the treatise of 1888, he says, "The pendentives of the cupolas of St. Front, worked normally to the curve in passing from the square plan of the springing of the arches to the circular plan crowning their key stones, are the embryoes of the pointed arch (*l'arc ogif*) or pointed groins (*croisée d'ogives*), according to the very ancient expression and which was still employed in the time of Philibert de L'Orme to describe the diagonal ribs (*arcs diagonaux*) supporting the vaults with the aid of the transverse ribs (*arcs-doubleaux*)."

M. Corroyer then goes on to show that the church of St. Vit the Elder, vaulted with three domes, has on the soffit of each dome eight ribs, the diagonal ribs running down to the starting point of the pendentives; and remarks that it has been stated, though not proved, that these cupolas were built, then pulled down and replaced by the vaults that now exist. He also shows a section of a similar dome with ribs at the Church of Saumur, on the Loire; and, in confirmation of his argument, he points to the domical shape the early groined vaults took, and to the bays being still kept square, when the domes were abandoned and groined vaulting substituted for them.

M. Corroyer has, no doubt, satisfied himself that his theory is right, but he has hardly made his theory more than probable to ordinary readers; and has certainly not made it as unassailable by adverse criticism as a proposition of Euclid.

The architectural profession ought to be, and probably is, grateful to him for his admirable book on Romanesque architecture. The author has certainly contributed his time, and probably his leisure and substance, for the benevolent purpose of enlightening his fellows. Still I respectfully suggest that, if M. Corroyer has the time and inclination, he would add to the debt of gratitude we owe him, by publishing a pamphlet to completely establish his theory.

G. AITCHISON.

*** We presume that Mr. Aitchison's letter was partly called forth by some remarks in our review of M. Corroyer's "Gothic Architecture" the other day. Since receiving it we have referred to M. Corroyer's work on "Romanesque Architecture," in which we observe that he gives a section of the domed roof at Fontevrault, which he dates 1101–1120, and which is a plain dome, and compares with it a section of the nearly similar roof at Saumur, in which the surface of the dome is divided by four ribs, and he seems to argue that this rib treatment shows the development of the ribbed vault from the domical roof. It seems to us that it may very well be the other way about, and that the appearance of the rib was the influence of the northern Gothic vaulting form making itself felt on the domed roof. But there is another question which we should like to ask—not of M. Corroyer, for we know that no French architect will either take the trouble to visit England to inspect our architectural monuments,* or accept any statement about them which does not square with his own theories; but we should like to ask our learned friend, Professor Aitchison, if he accepts M. Corroyer's view that Gothic vaulting was developed from the dome churches of the South of France, how does he account for the fact that cross-vaults on the Roman pattern were being built in the aisles of Durham and Norwich, at or probably *before* the date given by M. Corroyer to the Fontevrault roof?—ED.

* The late M. Ruprich-Robert is the only important exception we remember.

THE ORIENTATION OF CHURCHES.

SIR,—I think I can answer "H. E. T.'s" inquiry in your issue of February 18 (page 135), as to where Wordsworth got his information from. At the sale of the poet's books my father purchased a volume, bearing Wordsworth's name, and in which, on page 123, the following passage is underscored with red ink: "This Churche [St. Mary's, York] lyeth towards ye North Eeste bye North, for on Sancte Marie's Day ye Sonne thus ryseth." This quotation partly, at least, accounts for Wordsworth's note. The book is "Bartram's Travels of a City Gentelmanne thorough the Shire of Yorke." (London, 1799. No publisher's name.)

JAMES ARDENSTONE.

"BURR *v.* RIDOUT."

SIR,—Referring to the article which appeared in your issue of the 25th inst. on this case, and your note as to the defendant's obligation to expend 4,000*l.*, perhaps you will allow me to explain that under his agreement with the ground landlord the defendant was not bound to build at the nett cost of 4,000*l.*, but to erect buildings "of the total value of 4,000*l.*" This does not appear very clearly in the report of the case, but I need not point out to your readers the difference in these contracts.

J. A. COLLINS,
Defendant's Solicitor.

5, *New Inn, London, W.C.*,
February 28, 1893.

The Student's Column.

CHEMISTRY.—IX.

Coal and its Valuation.

COAL consists of the remains of vegetation which in the course of many thousands of years, and during many changes of nature, have become altered to their present form.

There are many varieties of coal, and it is by no means uncommon to meet with several kinds in the same mine. Roughly speaking, the value of a coal for heating purposes may be said to depend upon the amount of *fixed* carbon it contains, *i.e.*, the amount of carbon that is not driven off as gas when the coal is heated to redness without being allowed any contact with air or oxygen. For gas-making purposes the value of a coal may be said to depend upon the amount of *volatile* hydrocarbons it contains.

Thus *anthracite*, which contains a very large percentage of fixed carbon, is the best heating coal; but owing to the strong draught of air necessary to maintain it in a proper state of combustion, it is not suitable for use in the ordinary open grate. It is much used for closed stoves and for heating boilers, especially in America, where it is more abundant than in this country. Anthracite is a very hard, shiny coal which burns without flame, and does not soil the fingers when handled.

Steam or smokeless coal somewhat resembles anthracite, but requires less draught to cause it to burn readily. It burns with more or less flame, and does not contain so much fixed carbon as anthracite.

Free-burning Coal.—Under this head may be included most of the numerous classes of house coal. It burns with much flame, and is softer than either anthracite or steam coal, but should not cake together. Much of this kind of coal comes from Yorkshire.

Caking or bituminous coal gives off large volumes of smoke, and cakes together a great deal. It burns with a bright flame. This variety of coal is largely employed for gas manufacture, and is obtained chiefly from Northumberland and Durham.

Cannel or candle coal is very rich in volatile hydrocarbons, and is much used for enriching gas obtained from the cheaper classes of coal. It has a dull, black colour, and a slaty fracture. This variety of coal is closely akin to the *parrot coal* of Scotland and to the *rattlers* of Yorkshire. The coke from this kind of coal is usually almost worthless on account of the large amount of mineral matter or ash it contains.

Lignite is of a brown colour, and is lighter than ordinary coal; it often possesses a fibrous character, and appears more closely akin to peat than to coal. It is, however, largely used as fuel in some parts of the world. In determining the value of coal it is important to know the amount of unburnable ash that it contains, and also, if it is sold by weight, the quantity of moisture or water in it. Thus, two samples of coal supplied for heating purposes yielded the following results:—

	Moisture.	Ash.	Fixed Carbon.
(1)	6·02	5·18	58·66
(2)	8·15	23·00	42·15

The first is a fairly good sample of coal, and contains only 1·2 cwt. of water and 1 cwt. of ash in the ton of coal; but the second contains 1·6 cwt. of water and 4·6 cwt. of ash in the 20 cwt. of coal, that is to say, considerably more than one quarter of the coal is worse than useless. These are by no means extraordinary samples; worse coals than the second are often palmed off upon the private consumer.

Coal Gas.

Coal gas is obtained by heating coal in retorts at a red heat. The coal is thus decomposed, the fixed carbon and ash remaining in the retort in the form of coke, while the hydrocarbons and other compounds escape in the form of gas up a vertical pipe called the ascension pipe and through a water-seal in the horizontal pipe called the hydraulic main. The gas passes along the hydraulic main into the condensers. Here the hydrocarbons that are liquid or solid at the ordinary temperatures of the air, condense out as tar. The gas then passes into some large towers filled with coke, through which a stream of cold water is constantly descending. The crude gas ascending through these towers, or "scrubbers" as they are called, parts with its ammonia and a considerable quantity of carbonic acid and sulphuretted hydrogen, all of which may be considered as impurities. The solution thus formed is known as "gas liquor," or "ammoniacal gas liquor." The gas next passes through very large iron boxes containing layers of lime, and sometimes also oxide of iron. In these purifiers the remainder of the carbonic acid and sulphuretted hydrogen is removed. Finally, the gas passes through a similar box containing layers of lime, which have previously been saturated with sulphuretted hydrogen. In this box, or "purifier," the bisulphide of carbon is absorbed. The gas is now ready for storing in the gas-holders. It is the spent material from the sulphide purifiers which sometimes constitutes a public nuisance by the evil odour it emits. The following are the most important commercial substances obtained indirectly or directly by the distillation of coal and coal-tar:—Coke, ammonia, ammonium salts, aniline dyes, saccharine, carbolic acid, naphthaline, naphtha, creosote, and benzol.

Oxides of Carbon.

Carbon forms two oxides, viz. (1) carbon monoxide, and (2) carbon dioxide, commonly called carbonic acid gas. Carbon monoxide or carbonic oxide, CO, is a colourless and very poisonous gas. It exists in large quantities in water gas, *i.e.*, gas made by decomposing steam by driving it through red hot coke or carbon, thus:—

$$H_2O + C = CO + H_2.$$

Carbonic oxide possesses neither smell nor taste, and is therefore all the more dangerous when present in odourless gas supplied for domestic purposes.

Carbon monoxide may be prepared by passing carbon dioxide over red-hot carbon,

$$CO_2 + C = 2CO.$$

In this manner, carbon monoxide is formed in an ordinary coke fire, where the carbon dioxide first formed in the lower part of the fire by the complete oxidation of the carbon by the oxygen of the air, by rising through a further layer of red-hot coke, is converted into carbon monoxide, and may be seen burning with a pale blue flame at the top of the fire.

When carbon monoxide burns it forms, of course, carbon dioxide, thus:—$CO + O = CO_2$.

The gas may also be prepared by heating carbon with a limited supply of air.

$$C + O = CO,$$

but is usually obtained by heating oxalic acid with strong sulphuric acid, because it is a more convenient method, and by it a purer product can be obtained.

The reaction which takes place may be expressed thus:—

$$C_2H_2O_4 = H_2O + CO + CO_2.$$

(oxalic acid.)

The sulphuric acid abstracts the water, and the carbon dioxide may be separated from the carbon monoxide by passing the mixture through a solution of caustic potash, or soda, which absorbs the carbon dioxide and allows the carbonic oxide to pass through it.

Carbon dioxide, or carbonic anhydride, CO_2, is a colourless gas, but possesses a faintly acid taste and smell. It is found in small quantities in the atmosphere. It is one of the products of the decay of organic substances, and is, therefore, found at the bottom of disused wells in which there is decomposing vegetation or other organic matter. It is evolved in large quantities by vol-

canoes; and in certain caves and valleys, as in the case of the valley of Java, the gas is evolved so rapidly from fissures in the rocks or ground, that it contaminates the air to such an extent that anyone entering the valley is rapidly suffocated.

Carbon dioxide with water is believed to form a true acid, thus—

$$CO_2 + H_2O = H_2CO_3.$$

Hence, it is often called carbonic acid gas.

Carbon dioxide is formed by the action of almost any acid upon a carbonate. Thus, if dilute hydrochloric acid is poured upon some fragments of chalk or marble, the gas is so rapidly evolved that it causes great effervescence.

$$CaCO_3 + 2HCl = CO_2 + H_2O + CaCl_2.$$

(Chalk or Marble.)

Carbon dioxide issues in large volumes from lime-kilns, where limestone ($CaCO_3$) is decomposed by heat, thus—

$$CaCO_3 = CaO + CO_2.$$

(Quicklime.)

It should be noted here that with the exception of a little difference in purity, the chemical composition of chalk, marble, and other limestones is identically the same. The characteristics which make them of such different values as building-stones are due to physical differences only.

Carbon dioxide is a very heavy gas, and is not a supporter of combustion. Advantage is taken of this latter fact in testing a well as to whether it is safe to descend into it. A lighted candle is lowered to the bottom of the well, and if it is extinguished there is too much CO_2 in the well to render descent safe; if, on the other hand, the candle continues to burn brightly, the well may safely be entered.

The fact of CO_2 being a non-supporter of combustion, is also made use of in many of the patent "fire extinguishers," which contain some substance that will readily give off large quantities of carbon dioxide. Carbon dioxide forms the "choke-damp" of the miner, and is formed when marsh-gas, or "fire-damp," as it is called, is burnt or exploded.

$$CH_4 + 2O_2 = CO_2 + 2H_2O.$$

(fire-damp) (choke-damp)

Carbon dioxide is very soluble in water, and the lower the temperature of the water, or the greater the pressure of the gas upon the water, the larger is the volume of the gas dissolved by the water. If water is charged with CO_2 under a great pressure, and the pressure is then diminished, much of the carbon dioxide, which was dissolved under pressure, now escapes so rapidly as to cause brisk effervescence. This property is made use of in the manufacture of effervescing table waters.

The brisk taste of many *natural* mineral waters is due to carbon dioxide gas, dissolved in the water in a similar manner.

When charcoal or other form of carbon is burnt in excess of oxygen or air, carbon dioxide is formed thus—

$$C + O_2 = CO_2.$$

If, therefore, a charcoal fire is used in a room without means of ventilation, suffocation ensues. It is believed, however, that the fatal effects produced by charcoal fires have been due more especially to considerable quantities of carbon monoxide being formed by the incomplete combustion of the carbon, or by the subsequent reduction of some of the carbon dioxide by the red-hot charcoal.

If carbon dioxide gas is cooled to 0°C., and subjected to a pressure of 36 atmospheres, *i.e.*, 540 lbs. on the square inch, the gas condenses to a colourless liquid. If the pressure is then suddenly removed, the liquid immediately returns to the gaseous condition, and by doing so produces great cold. All liquids when changing from a liquid to a gas absorb heat, and consequently produce cold in surrounding bodies. On the other hand, when a gas changes to a liquid, heat is given out. It is a law that *change of state always produces change of temperature.*

It is only comparatively recently that liquid carbon dioxide has been made use of for refrigeration on a large scale. It is now employed by Messrs. Nelson Brothers at their largest sheep-freezing establishment in New Zealand, where they freeze over 2,000 sheep per day by it.

Experiments. Group 6.

1. Manufacture some carbon monoxide.

Place some crystals of oxalic acid and a little strong sulphuric acid in a test-tube, and heat gently. Apply a light to the mouth of the test-tube, and observe that the CO burns with a pale blue flame, but be careful not to inhale the gas.

2. Prepare carbon dioxide.

Prepare some carbonic anhydride by the action of some dilute hydrochloric acid upon some pure calcium carbonate just covered with water. The gas may be collected over water as usual, although somewhat freely soluble, but is most conveniently collected as shown in Fig. 11.

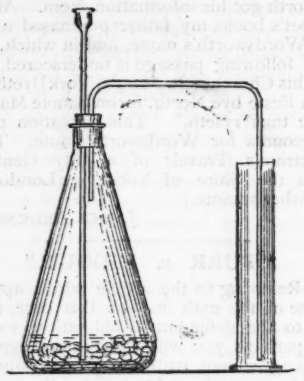

FIG. 11

With the gas thus collected prove—

(*a*) That carbon dioxide is a non-supporter of combustion, by plunging a lighted candle or taper in a jar of the gas, and noting that it is extinguished.

(*b*) That it is heavier than air, by pouring the gas from one jar into another jar filled with air, and showing by means of a lighted taper that the carbon dioxide is then in the jar previously filled with air; also by pouring the gas, like water, over the flame of a candle and thus extinguishing the candle.

(*c*) That it precipitates lime from its aqueous solution, by pouring some clear lime-water into a jar of the gas, and observing that it is rendered milky owing to the formation of insoluble carbonate of lime or calcium carbonate.

3. Prove that, by means of an acid, carbon dioxide may be obtained from any of the following substances:—(1) chalk, (2) marble, (3) oyster-shells, (4) pieces of coral, (5) old mortar, (6) all samples of limestones obtainable, (7) white lead.

OBITUARY.

MR. WILLIAM ALLEN BOULNOIS, F.R.I.B.A.—We regret to announce the decease on February 22 of Mr. W. A. Boulnois, of Inhurst, Basingstoke, and of No. 6, Waterloo-place, Pall Mall, S.W., the head of the firm of Messrs. Boulnois & Warner, architects. Mr. Boulnois was born in London in the year 1823. Having entered the classes at King's College, then known as the "Department of Science applied to the Arts," Mr. Boulnois became a pupil of Mr. S. Smirke, R.A., from 1842 to 1845, and after spending some few years in Italy and on the Continent in the study of his profession Mr. Boulnois commenced in London in 1848, and had an extensive practice. His works are found in the City of London in various blocks of offices and several wharf and factory premises on the river Thames. His practice extended to Sweden, where the Baron Oscar Dickson's house at Gothenburg and another house at Oferöis were built some twenty years since, and to Italy, where the "Villa Clara" at Baveno, Lago Maggiore — the house occupied by her Majesty Queen Victoria—was erected in 1872. Mr. Boulnois' latest public works in London are the Standard Assurance Company's building in King William-street, near Lombard-street, Lord Radstock's Conference Hall, Eccleston-street, Belgrave-square, and the "Great Assembly Hall" in the Mile End-road for Mr. Charrington, seating 5,000 persons, and works at Victoria Docks for Louisa Lady Ashburton, the Mission Hall there being opened by H.R.H. the Duchess of Teck in 1888, the Presbyterian Church at Mentone, France, opened by the late Mr. Spurgeon. Mr. Boulnois also practised as a surveyor in valuation and compensation cases, and was a member of the "Surveyors' Club," established 1792, in addition to his being a Fellow of the Royal Institute of British Architects, and a member of the Council in 1865, serving for some years on the committee of examination charged with the certificates for the qualification for District Surveyors. Mr. Boulnois is succeeded in practice by his nephew, Mr. Alfred E. Warner, A.R.I.B.A., F.S.I., who has been in partnership with his late uncle for some years past. The name of the firm will remain unaltered.

"SOME OLD CHURCHES OF GLAMORGANSHIRE."—A lecture in connexion with the Cardiff Naturalists' Society was given at the Queen-street Public-hall, Cardiff, on the 23rd ult., by Mr. C. B. Fowler, the subject being "A Ramble through some Old Churches of Glamorganshire." Mr. Fowler described the ancient fonts of Glamorganshire and Monmouthshire, crosses found in the churchyard, tombs, monumental slabs, windows, doorways, stoups, and other architectural features.

GENERAL BUILDING NEWS.

M'EWAN HALL, EDINBURGH.—The members of the Edinburgh Architectural Association visited, on the 25th ult., the M'Ewan Hall, where they were received by Dr. Anderson, the architect, who showed the party over the building. He explained that he had adopted the form of the Greek theatre, believing that to be the best form for the auditorium. There were two galleries, both alike, the one above the other, and the building was capable of holding three thousand people. The arrangement of the staircases was such that the occupants of the two galleries never came together, and there were a good many entrances and exits. A large skylight and a series of windows close to the roof furnish the principal means of lighting the building, and the air was to be heated by passing over a steam coil. There was a great outer wall, and an inner wall of arches and pillars, the diameter of the building being 144½ ft. To roof such a building was rather a problem, and he had called in the assistance of Mr. Westland, of Messrs. Cunningham, Blyth, & Westland. It was to be hoped that before long, the great tower would be erected—a tower which would reach to about 280 ft. in height. Behind the platform there was a gallery, where, he understood, there was to be erected an organ. Mr. Westland, at the request of the architect, described the construction of the roof. It was carried on twenty-two ribs, which had to be of peculiarly strong construction, because it was impossible to put in any tie-rods. The whole horizontal strain had to be borne by the bracing between the ribs. In connexion with the bracing, at the back of the stage the circle was not completed. If it had been a complete circle the strains would have been easily calculated, but, as the circle stopped, the whole strain had to be carried across the stage by means of a very heavy steel girder, weighing about 6 tons. In order to prevent any horizontal thrust on the walls, every rib was set upon rollers. At the close of the visit Mr. W. W. Robertson proposed a vote of thanks to Dr. Anderson.

A NEW COLLIERY VILLAGE IN NORTHUMBERLAND.—On the 13th ult. the first stone was laid of a new Northumbrian village which it is intended to create primarily for the workmen and their families, many hundreds in number, who are unable to find house room in the extensive colliery village of Ashington. A small freehold estate, in close proximity to the railway station at Ashington, has been purchased. The site is 130 ft. above the sea level, and overlies a bed of freestone. Sites for streets of cottages, terraces, and business premises have been laid out under the direction of Mr. William Glover, architect, of Newcastle, who has also designed a system of sewerage and water supply.

SCHOOLS, BOURNEMOUTH.—St. Andrew's Schools, Malmesbury-park, lately erected under the provisions of the Bournemouth Church School Extension Scheme, were opened by the Bishop of Guildford on the 13th ult. The buildings provide accommodation for 318 children, there being one large room 71 ft. 4 in. by 22 ft., and three class-rooms 24 ft. 8 in. by 23 ft. They are of red brick with ornamental tiling. The floors are laid with wood block paving, and the heating is by hot water pipes, each room having also a Teale grate.—On the same day were opened the St. John's Schools at Boscombe, built also in connexion with the Bournemouth Church School Extension Scheme. In these, accommodation is provided for 277 children. There are two floors with schoolroom 54 ft. by 18 ft., and two class-rooms 15 ft. by 20 ft., the rooms upstairs being the same size. The schools were erected by Messrs. Hoare & Sons, builders, of Bournemouth, the amount of the contract being 1,535*l.*, and are finished in a similar manner to the other schools. Both are designed by the same architect, Mr. R. Pinder, of the firm of Pinder & Fogerty, of Bournemouth.

PROPOSED VOLUNTEER DRILL HALL, LEICESTER.—It is proposed to erect a new Volunteer Drill Hall at Leicester, for which plans have been prepared by the County Surveyor (Mr. Beaumont Smith). The building, which is 120 ft. long, 50 ft. wide, and 18 ft. high to the wall plates, will be in character with the adjoining property. It will be provided with proper heating and lighting apparatus, and the floor will be of wood blocks. The lowest tender for the building, exclusive of roof principals, was that of Mr. F. Elliott, of Leicester, for 2,321*l.* 4s., which has been accepted, whilst Messrs. Handyside & Co., of Derby, have secured the contract for the iron work at a cost of 623*l.* 15s.

PRIMITIVE METHODIST CHAPEL, STAVELEY, YORKSHIRE.—The Primitive Methodists in the new mining village of Poolsbrook, Staveley, have commenced building a chapel in that place. The chapel will accommodate about 500, and is to cost about 600*l.* Mr. Earle, of Sheffield, is the architect, and Mr. Hodges, of Burton, has the contract.

CHURCH HALLS, PAISLEY.—New halls in connexion with St. George's Parish Church, Paisley, have just been completed. The new buildings are placed adjacent to the present church at the east side, leaving a passage between, and are designed in a Classic style in keeping with the church. They have a total frontage to George-street of 30 ft., and a length from front to back of 95 ft. The back por-

tion of the buildings connects with the existing Presbytery House. The main hall, which is entered from the passage to George-street, is 70 ft. long, by 27 ft. in breadth, having open timbered roof. This hall is seated to accommodate about 500 persons as a lecture hall, or nearly 400 as a Sabbath school. In addition to this there is a class-room 19 ft. by 10 ft., and a ladies room 17 ft. by 14 ft. 6 in., with lavatory attached; also general lavatories, which are entered from the north porch fronting Brown's-lane. The main hall is furnished with pitch pine wainscotting all round, 4 ft. in height. The principal timbers of the roof, which are stained and varnished, are exposed. The platform is placed in the centre of the east wall. The heating is by hot-water pipes fitted into brick channels beneath the floor. The designs were prepared by Mr. James Donald, architect, Paisley, and the following tradesmen were the contractors for the work:—Mason work, Hugh Houston; brick work, Robert Morton; joiner work, Cochran & Keith; plumber work, R. G. Young; plaster and granolithic work; D. T. Hutcheson; slater work, Thomas Kilpatrick; painter work, Cowan & Stewart; heating, James Boyd & Sons; iron work, Andrew Sproul & Sons; glazier work, Robert Kirk, all of Paisley; lighting, James Milne & Sons; pipe-laying, Kean & Wardrop, both of Glasgow; and Messrs. Duff & Henderson were the measurers.

FOREIGN AND COLONIAL.

FRANCE.—In the church of the Forges-les-Bains, near Rambouillet, some tombstones of considerable interest have been found, dating from the tenth century. According to the inscriptions on them they came from the burial places of the first lords of Forges, Odet and Claude de Baillon.—— The "Commission des Monuments Historiques" is undertaking the complete repair of the fine tower of the church of Bougival which was threatened with ruin. The church is one of the most interesting ancient monuments in the neighbourhood of Paris.——A statute to Max Séguin the engineer who is claimed as having invented the tubular boiler for locomotives, is to be erected on the Pont de l'Europe, above the cutting of the Chemin-de-Fer de l'Ouest near the Gare St. Lazare.——It is stated that the Dutch Protestants recently converted at Lourdes have contributed 3 million francs to the completion of the parish church of Lourdes, which has been at a standstill for fifteen years.——Mr. Alfred Boucher, the sculptor, has offered to the museum at Dijon the full-size model of his fine figure "A la Terre" which was published n the *Builder* in 1891, and gained its author the "Grand Médaille" of the Salon of that year.—— Lyons has now a new railway station in the Quartier de la Guillottière, the most populous part of the town. —— M. Roger Ballu, as delegate of the department of public instruction, has officially opened the exhibition of the Lyons Fine Art Society, in the Place Bellecourt. Among the works exhibited are pictures by MM. Detaille, J. P. Laurens, and Tony Robert Fleury. —— The town of Valence-sur-Rhône has opened a competition for a monument to the memory of Emile Augier. The committee has chosen fourteen artists for a limited competition, as well as the local sculptors and architects who have received medals at the Salon. A sum of 60,000 francs is to be expended on the monument.——It is announced that at Cabauzon (Gers), on the banks of the Uby brook, some workmen trenching have brought to light a good many capitals and bases of columns of the Roman epoch. The Department of Fine Arts has made a grant of money towards the continuance of the excavations.——At Saint-Quentin the exhibition of the designs for a commemorative monument of the siege of the town in 1557 has just been opened. Seven designs have been sent in, by MM. Cordonnier, Doublemard, Croisy, Deloye, Hiolin, Thomissen, and Puech.——The Duc de Parme, nephew and heir of the Comte de Chambord, is about to carry out extensive work in the restoration and beautifying of the Château de Chambord.——A decree of the President of the Republic has been issued authorising the erection of a new bridge over the Seine at Paris, between the bridge of Grenelle and that of the Point du Jour. The cost is estimated at 2,300,000 francs.

MISCELLANEOUS.

A CORRECTION.—By a printer's error which escaped notice, the name of Mr. "H. Hill" was referred to in the review of Mr. Burdett's book on Hospitals as one of those from whom he had received assistance; the actual reference was to Mr. Henry Hall.

A SWANSEA ARCHITECT'S CLAIM.—At the Swansea County Court on the 24th ult., before his Honour Judge Gwilym Williams, the hearing of an action brought by Mr. Edward Bath, architect, against Mrs. Jenkins, of the Osborne Hotel, Langland Bay, was resumed. The plaintiff claimed 98*l.* for professional services (plans, specifications, and bills of quantities), and defendant counterclaimed for 100*l.*, alleging negligence.—Mr. Jackson, instructed by Messrs. Davis & Ingram, was for the plaintiff; and Mr. David Lewis, instructed by Mr. Leyson, for the defence.—After hearing further evidence his Honour, in giving judgment, said that the question he had to decide was what were proper charges to be made by an architect of Mr. Bath's reputation. The evidence carried the conviction to his mind that the charges made by Mr. Bath were proper under the circumstances. Therefore he gave judgment for plaintiff for 88*l.* 6s. 8d.—*South Wales Daily News.*

ELECTRIC LIGHTING.—Craig House, Edinburgh, a large private lunatic asylum, is to be lighted by Messrs. Ernest Scott & Mountain, of Newcastle-on-Tyne. The installation will consist of:—two Lancashire boilers 25 ft. long by 7 ft. 6 in. diameter; four horizontal compound engines, each capable of giving 60 h.-p.; four Tyne compound-wound dynamos, each capable of running 400-16 c.p. lamps, and between 1,300 and 1,400 incandescent lamps and fittings. The same firm are about to carry out electric light installations at the Co-operative Wholesale Society's premises at Newcastle (this installation consisting of three Crossley gas-engines of 25 nominal h.-p., four 3-400 light dynamos and about 1,200-16 c.p. lamps), at Mr. John Dickenson's engine works, at Sunderland, and at Messrs. Chadwick & Sons' new spinning-mills at Bolton, and at Riga, Russia.

RENDLE'S PATENT "INVINCIBLE" GLAZING.—We understand that this method of glazing has been selected by the Great Eastern Railway Company for the roofs of the extension of Liverpool-street terminus, London. The area of the glazing amounts to about 100,000 ft. super. The same system has also been selected, by the architect, for the skylight over the National Portrait Gallery, Trafalgar-square. In each case the glass is laid in copper bars, and is the latest improved system of Messrs. W. E. Rendle & Co.

SOCIETY OF ARTS.—Professor Chandler Roberts-Austen will commence a course of three "Cantor" Lectures on "Alloys," at the Society of Arts, on Monday next, March 6, at five o'clock. The remaining lectures will be given on the two following Monday afternoons, at the same hour.

THE HOME IRON TRADE.—Business in the iron and steel and allied industries is very unsatisfactory. Both crude and finished iron are in limited inquiry, and it would seem that prices have not yet quite touched bottom. A satisfactory feature, however, is the renewed activity in the tinplate branch. The steel trade generally is depressed. Shipbuilders and engineers report few new orders to hand. The coal trade is somewhat irregular.—*Iron.*

THE RESTORATION OF EAST PRINCES'-STREET GARDENS, EDINBURGH.—According to the *Scotsman*, a vigorous beginning has been made with the restoration of the East Princes'-street Gardens. The slices of garden ground on each side required for railway purposes are now permanently appropriated, and the walls dividing the garden from the railway solidly built. To screen the railway as much as possible from view, an earthen mound, nearly as high as the top of the railings, will be raised just inside the retaining wall, and along it trees of good size will be planted. At the foot of this screen a narrow walk will be carried along the length of the gardens from east to west. A similar screen will be raised on the south side of the railway. The work at present in progress will cost nearly 1,500*l.*

TRADE FESTIVITY.—On Friday, the 24th ult., Messrs. E. Houghton & Son, builders and contractors, of Stroud Green, entertained about forty of their staff and principal workmen to dinner and a social evening, at Wortley Hall, Finsbury Park, Mr. W. Houghton occupying the chair. In responding to a toast to "The Firm," the chairman remarked that "growth" was a very suitable motto for the coming year, and thought one of the tendencies of the day to be guarded against was the restlessness and over haste in which men sought to obtain the end in view, and which very often led to mischief instead of success.

ASPHALTE PAVING, CAMBERWELL.—The footways in front of the Crystal Palace, to the extent of several thousand yards, are being relaid by the Camberwell Vestry with Limmer's asphalte.

MEETINGS.

FRIDAY, MARCH 3.

Royal Academy of Arts.—Professor J. H. Middleton, M.A., on "Michelangelo," II. 8 p.m.

Royal Institution.—Mr. George Simonds on "Sculpture considered apart from Archæology." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor A. Wynter Blyth on "Diseases of Animals in relation to Meat Supply; Characteristics of Vegetables, Fish, &c., unfit for Food." 8 p.m.

SATURDAY, MARCH 4.

Incorporated Association of Municipal and County Engineers.—Metropolitan Meeting: Visits to (1) Streatham and Brixton Cable Tramways; (2) River-wall in course of construction at Fulham; (3) Stabling and Jarrah-wood paving, Fulham; and (4) Electric Lighting Works, St. Pancras.

MONDAY, MARCH 6.

Royal Academy of Arts.—Professor J. H. Middleton, M.A., on "Michelangelo." III. 8 p.m.

Surveyors' Institution.—Mr. P. E. Pilditch on "Dilapidation Practice, particularly as affected by some recent decisions." 8 p.m.

Society of Arts (Cantor Lectures).—Professor W. Chandler Roberts-Austen on "Alloys." I. 5 p.m.

Society of Engineers.—Mr. E. G. Mawbey on "The Leicester Main Drainage, &c., and the Construction and Testing of the Sewage Pumping Engines and Boilers." 7.30 p.m.

'People's Palace" Technical Schools.—Distribution of Prizes by the Archbishop of Canterbury. 8 p.m.

Liverpool Architectural Society.—Mr. C. B. Alward on "Venice." 6.30 p.m.

Leeds and Yorkshire Architectural Society.—Exhibition of Architectural Drawings. 7.30 p.m.

TUESDAY, MARCH 7.

Institution of Civil Engineers.—Mr. W. Pitt on "Plant for Harbour and Sea-works." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Shirley F. Murphy on "Infectious Diseases and Methods of Disinfection." 8 p.m.

Manchester Society of Architects.—Mr. G. H. Willoughby on "Stray Thoughts on Competitions."

Glasgow Architectural Association.—Annual Business Meeting. 8 p.m.

WEDNESDAY, MARCH 8.

Architects' Benevolent Society.—Annual General Meeting. 5 p.m.

Carpenters' Hall, London Wall.—Professor Banister Fletcher on "The Italian Renaissance, as Exemplified in St. Peter's at Rome, the Palaces, &c., at Florence and Venice." 8 p.m. (*Admission free.*)

Sanitary Institute.—Mr. H. P. Boulnois on "The Housing of the Working Classes." 8 p.m.

Liverpool Engineering Society.—Professor H. S. Hele-Shaw on "The Graphical Method of Solving Engineering Problems." 8 p.m.

THURSDAY, MARCH 9.

Institution of Electrical Engineers.—Resumed discussion on Mr. W. M. Mordey's paper on "Testing Alternators." 8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, MARCH 10.

Architectural Association.—Mr. G. H. Fellowes Prynne on "Screens: their Treatment and Symbolism." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. Charles D. Barker on "Methods adopted in Constructing the Glasgow Central Railway Works—Bridgeton and Trongate Contracts." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. F. J. Sykes on "General Powers and duties of Inspectors of Nuisances." 8 p.m.

SATURDAY, MARCH 11.

Architectural Association.—Visit to the New Synagogue, Dennington Park-road, West Hampstead, by permission of the architect, Mr. Delissa Joseph. 3 p.m.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

2,348.—DISINFECTING APPARATUS: *M. Sefer.*—This invention relates to the attachment of a chamber containing any known disinfectant to the flush-pipe of the cistern used for flushing closets, drains, urinals, &c. The chamber containing the disinfectant is attached either inside a cistern or on the pipe outside at the most convenient place, but is preferably attached to the flush-pipe or syphon apparatus inside a small flush-tank, which is in general use in water-closets. This chamber has a small hole, or holes, in it, so as to allow the water when passing down the pipes to penetrate the chamber, and draw out sufficient of the disinfectant to colour or deodorise the water which is being discharged. When it is attached to the pipe, a hole, or holes, are made in the same, and the chamber connected thereto, so that the water has free access to the disinfectant. By this invention it is claimed that a very small quantity of the disinfectant is sufficient for the purpose required.

4,088.—BUILDING STONE CONNEXIONS: *G. Leicht.*—This patent relates to a device for securing together stones, plates, or slabs in such a manner, that when the rectangular blocks or plates are laid upright upon each other in two or more courses they form solid and durable walls. For this purpose specially formed metallic clamps are employed, one or more of which are applied to the top, bottom, and side of each block, or wherever the block has to be connected with adjoining blocks. Each of these clamps consists of two ordinary rectangular shaped clamps placed back to back, and out of line with each other, the clear width of each clamp being equal to the horizontal width of the block or plate, one side serving to grip the edge of one stone, while the other side serves to grip the adjoining stone. The two sides of each clamp are made of one piece, or rigidly fastened together to form practically one piece.

4,929.—HEATING APPARATUS: *E. R. Starmer.*—This invention relates to an improved method and apparatus for heating rooms, intended more especially for intercepting a great portion of the heat which now escapes up the chimney of open fire-places, and utilizing such heat for warming the air in the room in which the fire is, or other room or rooms of the building. It consists in the employment of hollow structures adapted, when heated, to cause a circulation of air through them, by drawing in air at one or more inlet openings at or near the bottom of the structure, and discharging such air after it has been warmed by contact with the interior surface of the structure through one or more outlet openings at or near the top of the structure. These structures may be placed in the fire-place behind and below the fire, or just above the fire, or in the chimney.

9,209.—FIRE-PROOF FLOORS: *R. Astley.*—The object of this invention is to construct fire-proof floors in such a manner as to provide efficient protection in case of fire to the joists and girders supporting them, which joists or girders being made of iron or steel are very apt to give way by bending when heated to any great extent. The invention provides a number of joists of iron, or other suitable metal, about 2 ft. apart. Between the joists are placed lintels of fire-clay, or other fire-proof material, of I cross section. These lintels are placed with their flanges horizontal, to form a flat ceiling, the upright web being curved to allow of tiles, preferably curved, sheet metal, or other suitable material, preferably incombustible, being placed over them. On the tiles or other material is placed a layer of concrete, flush with or covering the top of the joists, thus forming an arch springing from joist to joist without the aid of temporary centreing. Slots are cut in both ends of the lintels, to allow the flange of the same to pass under the bottom flange of joists and girder, and protect the same from fire. The underside of the flange of the lintels is grooved to receive ceiling plaster.

NEW APPLICATIONS FOR LETTERS PATENT.

February 13.—3,137, H. White, Stench Trap for Drains, Sewers, &c.—3,148, B. Rowntree, Shades or Blinds for Sloping Roofs of Greenhouses, Conservatories, &c.—3,161, S. Marsden, Window-fastener.—3,196, F. Romhildt, Veneer Drying Apparatus.—3,198, F. Stokes and others, Smoke-Cure Chimney-pot.

February 14.—3,220, R. Bateman, Nails.—3,230, C. Wood, Grooving, Mitreing, and Chamfering Machine for Cutting V Grooves, Mitres, and Chamfering of any given angle.—3,246, T. Jones, Refractory and Non-Conducting Bricks, Blocks, Tiles, &c.—3,256, W. Smith, Joining or Connecting Sanitary Pipes, &c.—3,258, J. and B. Emmott, Chimney Pots.—3,272, G. Gibson, Sash Locks for Windows.—2,283, W. Davis, Tops or Cowls for Chimneys, Ventilating Shafts, &c.—3,292, R. Cheseborough, Roof Coverings, &c.—3,318, J. Gelardin, Saw Frames.—3,322, H. Seddon, Facing Plates, Tiles, &c.

February 15.—3,356, A. Hely, Preservation of Wood.—3,365, P. Manning and J. Andrews, Flushing Cistern and Water Waste Preventer.—3,366, H. Smith, Pedestal Valve Water-closet.—3,379, A. Hemingway, Window-fastener.—3,383, J. Berge, Parquet Floors, Panels, &c.

February 16.—3,427, A. Barr, Step Ladders.—3,429, P. Jackson, Paving for Streets, Floors, &c.—3,442, E. Martin, Combination Level, Bevel, and Square.—3,453, F. Horne, Prevention of Condensation on Windows.—3,476, J. Jofeh, Checking Workmen's Time.—3,494, E. Baudry, Portable Adjustable Platform to be used as a Fire-escape, Building Scaffolding, &c.

February 17.—3,508, J. Clayton, Sash-fasteners.—3,551, E. Burt, Slide Rule for Cubing Timber, &c.

February 18.—3,596, W. Gould, Silent Door Closer.—3,613, D. Gardner, Parquetry.—3,628, C. Gabriel, Sash-fastener.—3,629, J. Duckett & Son, Limited, Smoke Consuming Apparatus.—3,662, G. Housden and F. Pateman, Ventilators.

PROVISIONAL SPECIFICATIONS ACCEPTED.

22,988, D. Baron, Combined Inlet and Outlet Ventilator.—22,989, D. Baron, Ventilating Rooms and Buildings. 1893: 131, H. Gore, Clamp for Fixing Mantelboards, &c.—341, A. Calmour, Window Frame Fastening.—460, W. Green, Hydraulic Main Cock.—709, E. Pim, Heating Stoves, Fire-places, or Grates.—718, W. Simpson, Glue Brushes.—774, R. Yorke, Pipe for Conveying Water, Soil, Gas, Waste, and other Products.—849, W. Griffiths, Disinfectant Paints.—872, G. Farr, Safety Window-sash.—1,150, C. Atlee, Window-fasteners.—1,153, F. Carel and W. Davidson, Revolving Fire-grate.—1,169, H. Wright and W. Smith, Grates of Fire-places.—1,221, S. Wyand and L. Schramin, Top for Smoky Chimneys, applicable also for Ventilating Purposes.—1,379, C. Pickles, Stoves or Ranges, &c.—2,046, H. Lake, Apparatus for Boring Tunnels.—2,055, A. Bridgman and D. House, Saw Benches.—2,227, J. Lumley, Instrument for Marking or Striking out the Mould of Stair Handrails.—2,441, C. Hancock, Cisterns and Water Pipes.—2,498, W. Horn, Wood Moulding Machines.—2,655, A. Burrow, Distemper, Whitewash, and other Brushes.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Hospital & Separate Adjoining Offices ..	Barking Tn. Loc. Bd.	..:	Mar. 14
Extension of and Alterations to Municipal Buildings	Rotherham Corp.	50*l.*	April 15
Church, Walton-le-Dale, Preston	The Committee	.....	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Making-up of Roads	Tottenham Local Bd.	J. E. Worth	Mar. 7
*Works and Materials	do.	do.	do.
*Roadmaking and Paving Works.....	Lewisham Bd. of Wks	*Official*	do.
*Works and Materials	do.	do.	do.
*Thames Ballast and Sand	St. Saviour's B. of W.	do.	do.
Sewerage and Drainage Works	Rotherhithe Vestry ..	do.	do.
*Materials for Paving Street	Greenwich Bd. of W.	do.	do.
Church Buildings, &c.	Hepple, Rothbury	C. Hodgson Fowler ..	do.
Six Cottages, Westhoughton, Lancs.	United Industrial Soc.	.....	do.
Business Premises, Plymouth	S. H. Colwill.....	F. A. Weblin	do.
Four Houses and Shops, Featherstone, Yorks	J. Maxwell	W. H. Fearnley	do.
Boiler House, Chimney Shaft, &c.	Harrington (Cumberland) & Distington Water Committees ..	J. Shackley	do.
*Cast-iron Sewer Pipes, 24 in. and 21 in. (2,000 yds.).....	Loughborough T. C.	A. W. Cross.....	do.
Purifying House and other Works..... ..	Atherton Local Board	T. Newbigging	do.
Wrought-iron Pier, Rosneath	His Grace the Duke of Argyll.....	Wharrie, Colledge, & Brand	do.
Board-room and Shop Premises, Barnsley	Barnsley British Co-op. Soc. Lim.	Wade & Turner	do.
Widening and Improving Roads, Cadoxton.....	Barry, &c. Local Bd.	J. C. Pardoe.....	do.
Granite, Flints, &c.	Leyton (Essex) L. B.	W. Dawson	do.
Drainage of Undercliff	Whitby Local Board..	T. K. Scott	do.
Four Houses, Frazerburgh, N.B.	.....	D. M'Millan.....	Mar. 8
County Police Station, Whalley, Blackburn.....	.....	Varley & Sandbach ..	do.
Broken and Cob Limestone.....	Rishton (Blackburn) Local Board	J. I. Helur	do.
Kerbing, Flagging, &c. Stainland, Yorks.	Stainland, &c. Loc. B.	J. H. Walker	do.
Supplying and Laying Water Mains (370 ft.).....	Newbury Corp.	E. A. Stickland	do.
Alterations and Additions to Bell Close Farm, Southouran	.....	R. Berry	do.
Cast-iron Pipes and other Ironwork	Preston Corporation..	*Official*	do.
Pipes, Slates, Bricks, &c.	Swansea Corporation	do.	do.
Pipe Sewers (9 in.), Ryhope.....	Sunderland U.R.S.A.	do.	do.
Main Sewer (5 ft.), Maryhill	Glasgow Police Com.	do.	do.
Wrought-iron Fence, Victoria-park	LondonCountyCouncil	do.	do.
Cast-iron Waterpipes, &c.....	Leeds Corporation ..	do.	Mar. 9
Heating, Ventilating, &c. Fire Station ..	Rochdale Corp.	do.	do.
Shop, Workroom, West Bowling, Bradford	.....	J. T. Parkinson	do.
School of Cookery and Fittings, West Boldon.....	Boldon School Board	G. T. Brown.....	do.
Sewering, &c. Estate, Buggate, Leeds ..	Garforth Freehold Land Allotment Association	R. Wood	do.
Shops, &c. at Pier Entrance	Blackpool Pier Co. ..	.....	do.
Main Sewerage and Sewage Disposal Works (1st section).....	Knaresborough L. B.	D. Balfour.....	do.
Parsonage House, Llanarthney, Carmarthenshire.....	.....	D. Jenkins.....	Mar. 10
Vicarage, Rhandirmyn, Llandovery.....	.....	do.	do.
Eleven Houses, &c.....	Dewsbury Pioneers' Industrial Society ..	Holtom & Fox.....	do.
Offices, &c. Waring-street, Belfast	W.D. Henderson & Sons	S. P. Close	do.
Retail Stores, Hemsworth, Yorks	Barnsley British Co-op. Society, Lim.	Senior & Clegg	do.
Broken Granite, Granite Cubes, &c. Grantham	Belvoir District Highway Board	W. R. Daybell	do.
Lavatory and Public Conveniences	Gt. Yarmouth Corp. ..	J. W. Cockrill	do.
*Sanitary Work, Caterham Asylum	Met. Asylums Board	*Official*	do.
*Repairs to Roads, Darenth	do.	A. & C. Harston.....	Mar. 11
Club Premises, Swindon.....	Com. of Gorse Hill Workmen's Club	R. J. Beswick	do.
School Buildings, Parish Room, &c. Warwick.....	Com. of St. Paul's Church.....	F. H. Moore	do.
Alterations and Additions to Moor School	Sunderland Sch. Bd.	J. Rounthwaite	do.
Alterations and Additions to Gasworks..	Bridgnorth Gas Co. ..	.....	do.
*New Sunday School and Parish Room....	St. Paul's, Warwick ..	F. H. Moore.....	do.
Two Semi-detached Villas, Holmfield, Halifax.....	.....	G. Buckley & Sons ..	do.
School Buildings, Kinsley, near Wakefield	.....	W. Richardson.....	do.
Making New Road, &c.....	Halifax Corporation ..	E. R. S. Escott	Mar. 13
*Concrete Sea Wall, Spital (1,600 cub. yds.)	Berwick-upon-Tweed U.S.A.	Mr. Dickinson.....	do.
Street Improvement Works.....	Ogmore and Garw Local Board	H. O. Williams	do.
*Works and Materials	St. Pancras Vestry....	W. N. Blair	do.
*Supply of Stoneware Pipes	West Ham Council ..	Lewis Angell	do.
Outfall Sewer, 15 in. Fireclay Pipes (2,500 yds.), Motherwell, N. B.	The Police Commrs...	J. B. McCallum	do.
House for Medical Superintendent, Sedgefield	Durham County Council	W. Crozier	do.
*Making-up Roads.....	Richmond (Surrey) Town Council	E. J. Lovegrove.....	do.
*Works and Materials	St. Giles Bd. of Works	G. Wallace	do.
*Craven Arms Water Supply.....	Ludlow R.S.A.	W. Wyatt	do.
Four Dwelling-houses, Leatham-street, Carlisle	H. Messenger	.....	do.
Setts, Flags, Road Metal, &c.....	Salford Corporation ..	*Official*	do.
Forty-two Cottages, Darton, Yorks.....	Woolley Coal Co.	do.	do.
*Supply of Materials.....	Camberwell Vestry ..	do.	do.
*Portable Hospital	Barking Town Loc. B.	do.	Mar. 14
School Buildings (300 seats), &c.	Denbigh School Board	do.	do.
*Supply of Materials	Colchester Twn Coun.	do.	do.
*Supply of Disinfectants	Camberwell Vestry ..	do.	do.
*Roadmaking Works.....	West Ham Council....	Lewis Angell	do.
*General Paving Works	do.	do.	do.
*Supply of Materials.....	do.	do.	do.
Schoolroom, Penrhiwgent, Porth	Com. of St. Paul's Church.....	D. Matthew	do.
Extensive Additions to Municipal Buildings	Crediton (Devon) T. C.	S. Dobell	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Two Shops and Dwelling-houses, Corwen	Lewis Edwards	R. T. Jones	Mar. 14
Dairy Buildings, Kelvinside, Glasgow....	Sorn Dairy Supply Co.....	W. Ingram	do.
*Underground Convenience	St. George-the-Martyr, Southwark	Mr. Hiscock	do.
*Mortuary, Coroner's Court, &c.....	Westminster Vestry ..	G. R. W. Wheeler....	Mar. 15
Iron Roof at Waterworks, &c.	Selby Local Board ..	T. Mallinson.....	do.
Tar-paving Footways	Bristol U.S.A.....	F. Ashmead.....	do.
Asphalting Footways	do.	do.	do.
Taking-down and Re-building Two Shops, Three Cottages, &c. Newport, Mon...	Trustees of the late J. Clarke	E. A. Lansdowne	do.
Embankment and Miscellaneous Railway Works	North Eastern Ry. Co.	H. Copperwaite	do.
Police Station, Sandhurst	Berks County Council	J. Morris	do.
Chapel, Newhaven, Sussex	The Trustees	C. Bell	do.
Constructional Ironwork for Fifty-five Bridges over Dortmund-Ems Canal (260 tons each)	Prussian Canal Com...	*Official*	do.
Fourteen Retorts, Firebricks, &c.....	Matlock Gas Co.....	do.	do.
Passenger Station, Elland, Leeds	Lancs. & Yorks. Ry. Co.....	do.	do.
Flagging, Granite Setts, Road Metal, &c.	Littleburgh (Lancs.) Local Board	do.	do.
*Works and Materials	Fulham Vestry	do.	do.
Paving Flags, Channelling, &c.	Carlisle Corporation ..	W. Howard-Smith....	Mar. 16
Road Works, Chipping Norton	Chadlington District Highway Board	F. Forrester.....	do.
Hospital, Blackpool.....	The Trustees	T. P. Worthington ..	do.
*Sorting Office, Bath.....	Com. of H. M. Works	*Official*	Mar. 17
Italian Black Poplar, St. Helen's, Lancs. (18,000 cub. ft.).....	.....	Pilkington Bros.....	do.
School Buildings, Bunetsfield	Edinburgh School Bd.	R. Wilson	Mar. 18
Condenser (1,000,000 ft. per day) and other Gas Apparatus and Plant.....	Walsall Corporation ..	J. Tindall	do.
*Roadmaking and Sewers Work, Southend	.....	W. V. Willson.....	do.
Railway Works, Vigan (22,340 metres)....	Gaid Prefecture	*Official*	do.
*Erecting School, Woolwich, &c.	School Bd. for London	do.	Mar. 20
*Chapel, &c.....	Whaplode Burial Bd.	do.	do.
*Works and Repairs to Sewers, &c.	Limehouse Bd. of W.	do.	do.
*New Main Sewers, &c.....	Bournemouth T. C. ..	F. W. Lacey	do.
*Alterations to Workhouse.....	Petworth Union	H. Howard	do.
Retorts, Fireclay, &c.....	Rotherham Twn Coun.	C. B. Newton	do.
Road Metal (6,000 tons)	Brixworth High. Bd.	T. Gulliver.....	do.
Leading and Laying 5 miles Cast-iron Pipes (6 in. to 16 in.), &c. Contract No. 3)	Bury Corporation	J. Cartwright	Mar. 21
Road Repairs, &c. Cerne Abbas, Dorset	Cerne Highway Board	G. Durden.....	do.
Cast-iron Water Mains	Newport (I. of W.) Corporation	*Official*	do.
*Sewers, &c.	Lewisham Bd. of Wks	do.	do.
*Steam Cooking Apparatus	Parish of Brighton....	do.	do.
*Widening Line between Lostwithiel and Par	G. W. R. Co.	do.	Mar. 22
*Laying Ballast and Permanent Way, &c. Cardiff.....	do.	do.	do.
*Passenger Station, &c. Teignmouth.....	do.	do.	do.
Sewerage Works, Pipe Laying, &c. (6,600 yds.).....	Blackburn Corp.....	J. B. McCallum	do.
*Retort House	Rochester, Chatham, & Strood Gas Co. ..	*Official*	Mar. 23
Unbroken Flints (2,500 yds.).....	Canterbury U.S.A. ..	do.	do.
Construction of Bridge at Balsh.....	Roumanian Ministry of Public Works	do.	Mar. 25
Road-Metal. Kerbs, Setts. &c.	Rawtenstall Corp.....	H. A. Cutler.....	Mar. 27
*Farm Buildings, &c. Claybury Asylum Estate	LondonCountyCouncil (Asylums Committee)	G. T. Hine	do.
*Alterations, &c. to Workhouse	Thakeham Union	Scott & Cawthorn	do.
*Twenty-three Houses, Catford, S.E.	.....	F. & W. Stocker	Mar. 30
*Extensions of General Offices	Consett Iron Co. Ltd.	*Official*	No Date
Street Improvement Works.....	Rushden Local Board	do.	do.
Four Houses, Garforth, Leeds	.....	R. Wood	do.
Construction and Furnishing Sewage Works	Thornhill (Yorks) Loc. Board	J. C. Hallier.....	do.
Alterations and Additions to Club Premises.....	Sunderland and North Durham Liberal Clb. Committee	.....	do.
School Buildings, Flove, Northants.....	National Schs. Com..	M. H. Holding.....	do.
Extension of School Buildings, Semilong, Northants	.....	do.	do.
School Buildings, Abbaylix, Ireland.....	.....	H. C. Fitzherbert	do.
Five Pairs of semi-detached Villas, Manchester.....	Mr. Pilling.....	.....	do.
Forming, Sewering, &c. Danes Hill-road, Leicester	.....	C. Ogden	do.
Class-room, Stoney Middleton, Sheffield	The Schools Com.....	.....	do.
Six Dwelling-houses, Padiham-road, Burnley	H. Greenwood.....	Hitchin, Son, & Lancaster	do.
Villa Residence. Manor House-street, Peterborough	.....	W. Boyer	do.
Dwelling-house, Harris-street, Peterborough	Mr. Sandell	J. G. Stallebrass	do.
Two Dwelling-houses, Cornwall-road, Peterborough	.....	do.	do.
Lodge, &c. Stanwix, Cumberland.....	His Grace the Duke of Devonshire.....	C. J. Ferguson.....	do.
Lace Factory, Ilkeston	.....	C. S. Doughty.....	do.
School Buildings, Abergavenny	Voluntary Schs. Com.	E. A. Johnson.....	do.
*Country House, Tavistock	.....	S. Knight	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Second Road Foreman	Shoreditch Vestry....	2*l.*	Mar. 7
*Clerk of Works	Sch. Bd. for London	150*l.*.....	Mar. 9
*Clerk of Works	LondonCountyCouncil	3*l.* 3*s.* weekly	Mar. 13
Assistant Surveyor	Bromyard Highway Board	110*l.*	Mar. 14
*Sanitary Inspectors (3)	Battersea Vestry	101*l.* &c.....	do.
*Superintendent and Matron.....	Burton-on-Trent, &c. School Board.....	120*l.* &c.	Mar. 18
*Clerk of Works.....	Acton School Board..	2*l.* 10*s.*.....	No Date
*Clerk of Works	Carlisle U.S.A.	Not Stated	do.

Those marked with an Asterisk (*) are advertised in this number. *Contracts, pp.* iv., vi., viii. ix., *and* x. *Public Appointments, pp.* xxiv. *and* xxv.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

1,094, R. Crompton, Linings or Coverings for Walls, Ceilings, &c.—5,989, A. Taylor, Dressing-stone.—12,221, J. Hartell, Telescoped, Circumferential, Atmospherical, Reflecting Chimney-pot.—21,580, W. Bevitt, Prevention of Down Draught in Chimneys.—23,396, A. Ward, Pavements for Mantelpieces.—23,482, W. Thompson, Hand Devices or Tools for Inserting or Withdrawing Screws, &c. 23,829, F. Clere, Construction of Window-sashes to facilitate Cleaning, &c.—1893.—354, F. Beny, Bricks or Blocks for Building Purposes.—523, C. Longley, Wood Blocks for Flooring, &c.—1,058, G. Thiell, Apparatus for Controlling the Draught in Chimneys.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 20.—By *Elliott, Son, & Boyton:* F.g.r. of 15*l.* 10s., Cambridge-pl., Kilburn, reversion in 71 yrs., 48*l.*; f.g.r. of 4*l.*, Stanhope-st., Hampstead-rd., reversion in 46 yrs., 160*l.*; 223, Stanhope-st., f., r. 20*l.* 12s., area 1,200 ft., 2,510*l.*

FEBRUARY 21.—By *Broad & Wiltshire:* 15, Wellclose-sq., Whitechapel, f., r. 32*l.*, 310*l.*; 11, Cannon-st.-rd., St. George's-in-East, f., r. 26*l.*, 325*l.*—By *Hampton & Sons:* 4, Montpelier-pl., Knightsbridge, f., r. 34*l.* 13s. 4d., 650*l.*; 4, Rutland-st., f., r. 30*l.*, 530*l.*—By *Debenham, Tewson, & Co.:* f.g.r. of 340*l.*, Oxford-st., reversion in 88 yrs., 1,800*l.*; 76 and 78, Clerkenwell-rd., Clerkenwell, and cottage, f., r. 138*l.* 9s., 2,500*l.*; 70, 72 and 74, Clerkenwell-rd., f., r. 332*l.*, 4,100*l.*; f. shop and premises, area 3,280 ft., r. 64*l.*, 1,060*l.*; 120, St. John-st., f., r. 110*l.*, 1,640*l.*; No. 118, St. John-st., f., r. 75*l.*; and a f.g.r. of 180*l.*, secured upon the "Criterion" Public House, Reversion in 62½ yrs., 5,125*l.*—By *Chinnock, Galsworthy & Co.:* F.g.r. of 39*l.*, Tintern-st, Stockwell, reversion in 84 yrs., 940*l.*; f.g.r. of 164*l.* 12s., Ducie-st., reversion in 82 yrs., 3,000*l.*; f.g.r. of 73*l.* 10s., Ferndale-rd., reversion in 58 yrs., 1,850*l.*; f.g.r. of 12*l.*, Torrens-st., reversion in 82 yrs., 270*l.*; f.g.r. of 68*l.* 10s., Medwin-st., reversion in 82 yrs., 1,600*l.*; f.g.r. of 124*l.*, Santley-st., reversion in 82 yrs., 2,950*l.*; f.g.r. of 19*l.* 10s., Allardyce-st., reversion in 82 yrs., 455*l.*—By *Dyer, Son & Hilton* (at Lee): 133 and 135, High-rd., Lee, u.t. 64 yrs., g.r. 17*l.* 10s., 615*l.*; 5, 6 and 7, Eaman-st., Blackheath, u.t. 35 yrs., g.r. 9*l.* 12s., 450*l.*

FEBRUARY 22.—By *A. Chancellor:* 2, The Green, Richmond, and 2, Duke-st., f., r. 70*l.*, 2,850*l.*; "Markham Lodge" and "Donegal Lodge," Kingston Hill, f., 1,000*l.*—By *R. Tidey & Son:* 9, Domingo-st., Old-st., f., r. 39*l.*; 16, Memel-st., f., r. 30*l.*, 400*l.*; 125, 129, and 131, St. Thomas'-rd, Finsbury-pk., u.t. 71 yrs., g.r. 9*l.*, r. 92*l.*, 860*l.*—By *D. Young:* F.g.r. of 25*l.*, Moat-pl., Stockwell, reversion in 51 yrs., 630*l.*; 117 to 131 (odd), Stockwell-rd., f., 1,600*l.*; f.g.r. of 54*l.* 12s., Stockwell-rd., reversion in 49 yrs., 1,475*l.*—By *Chinnock, Galsworthy & Co.:* f.g.r. of 17*l.*, Barton-st., Kensington, reversion in 94 yrs., 4,510*l.*; f.g.r. of 16*l.*, Comeragh-rd., reversion in 94 yrs., 4,225*l.*; f.g.r. of 22*l.*, Castletown-rd., reversion in 94 yrs., 5,730*l.*; f.g.r. of 24*l.*, Avonmore-rd., reversion in 94 yrs., 645*l.*; f.g.r. of 7*l.*, Homestead-rd., Fulham, reversion in 86 yrs., 170*l.*; f.g.r. of 85*l.*, Reporton-rd., reversion in 85 yrs., 2,070*l.*

FEBRUARY 23.—By *Mullett, Booker & Co.:* 6, Southwick-cres., Hyde-pk., u.t. 42 yrs., g.r. 2*l.*, 2,000*l.*—By *Pinel & Sons:* 3, Hampden-st., Harrow-rd., u.t. 52 yrs., g.r. 5*l.*, 280*l.*; 8 and 10, Hampden-st., u.t. 52 yrs, g.r. 10*l.*, 560*l.*; 33, Waverley-rd., u.t. 55 yrs., g.r. 5*l.*, 320*l.*; 2, Windsor-pl., u.t. 52 yrs., g.r. 4*l.* 10s., 195*l.*—By *Messrs. Trollope:* 13, Great Queen-st., Westminster, f., 5,700*l.*—By *Farebrother, Ellis, Clark, & Co.:* No. 129, Maida Vale, u.t. 40¾ yrs., g.r. 15*l.* 15s., 1,220*l.*—By *Dyer, Son, & Hilton:* 2, Woodstock-villas, Lee, u.t. 82 yrs., g.r. 15*l.*, r. 70*l.*, 500*l.*—By *Newbon & Co.:* 29, Devonshire-st., Islington, f., r. 48*l.*, 680*l.*; 16 to 24 (even), Oriel-rd., Homerton, f., r. 140*l.*, 1,545*l.*; 6, Park-st., Islington, u.t. 44 yrs., g.r. 6*l.*, r. 30*l.*, 175*l.*; 37, St. Paul's-st., u.t. 34 yrs., g.r. 6*l.* 6s., r. 36*l.*, 280*l.*; 8, Ribblesdale-rd., Hornsey, u.t. 55 yrs., g.r. 8*l.* 10s., 600*l.*; 5, Ravenstone-rd., u.t. 84 yrs., g.r. 6*l.* 10s., 200*l.*; 4, Cromwell-rd., Holloway, u.t. 77 yrs., g.r. 6*l.*, r. 40*l.*, 270*l.*; 78, Winston-rd., Stoke Newington, u.t. 67 yrs., g.r. 5*l.*, r. 32*l.*, 315*l.*—By *Stimson & Sons:* 37 and 39, Glengall-rd., Old Kent-rd., f., r. 74*l.*, 860*l.*; 93, Marlborough-rd., and 22, Regent's-row, Dalston, u.t. 51 yrs., g.r. 4*l.*, 590*l.*; 36, Horton-rd., Hackney, u.t. 65 yrs., g.r. 5*l.*, r. 32*l.*, 300*l.*; 34, Norman-rd., Bow, and stabling, f., r. 31*l.*, 500*l.*; 8, Grosvenor Rise East, Walthamstow, f., 300*l.*; four plots of f. land, Walpole-rd., &c., Woodford, 130*l.*; 14 to 24 (even), St. Agnes-pl., Kennington, u.t. 74 yrs., g.r. 48*l.*, r. 238*l.*, 2,045*l.*; 16, Rosenau-rd., Battersea, u.t. 87 yrs., g.r. 7*l.*, 395*l.*; 2 and 3, Lowless-ter., Peckham, u.t. 71 yrs., g.r. 8*l.* 10s., 500*l.*

FEBRUARY 24.—By *Day & Sons:* 59, Quilter-st., Bethnal Green, u.t. 29 yrs., g.r. 4*l.* 4s., 200*l.*—By *Moss & Jameson:* f. house, seven cottages, and "The Boot" beer-house, Kingsbury, r. 83*l.* 10s., 1,830*l.*; 89 and 91, Hartfield-rd., Wimbledon, and plot of land, f., 975*l.*; an i.r. of 150*l.* 13s. 9d., Westminster, secured on premises in Coburg-row, u.t. 12½ and 9 yrs., 600*l.*—By *Montagu & Robinson:* 44, Grafton-st., Mile End, u.t. 56 yrs., g.r. 4*l.*, 430*l.*; f.g.r. of 8*l.* 8s., Cossey Villas, Clapton, reversion in 92 yrs., 180*l.*; 18, 20 and 22, Gruneisen-rd., Finchley, f., r. 58*l.*, 300*l.*; 7 to 13 (odd), and 14 and 16, Brownlow-rd., Forest Gate, u.t. 75 yrs., g.r. 24*l.*, 415*l.*; 1 and 7, Annesley-rd., Holloway, u.t. 76 yrs., g.r. 12*l.*, 290*l.*; 68 to 76 (even), Pelham-rd., Wimbledon, u.t. 74 yrs., g.r. 25*l.*, 425*l.*; 10, Windsor-ter., Willesden, u.t. 87 yrs., g.r. 6*l.*, r. 30*l.*, 190*l.*; 1 and 2, Bridge-row, Wallington, u.t. 74 yrs., g.r. 15*l.*, 50*l.*; 109 to 121 (odd), and 169, Gipsy-rd., Gipsy Hill, u.t. 77 yrs., g.r. 45*l.*, 945*l.*—By *Baker & Sons:* 21 and 22, Elwin-st., Bethnal Green, u.t. 29 yrs., g.r. 8*l.* 8s., 435*l.*; 7, 9 and 11, Quilter-st., and 4, Elwin-st., u.t. 29 yrs., g.r. 18*l.* 18s., 700*l.*; 23 to 33 (odd), Wimbolt-st., u.t. 29 yrs., g.r. 36*l.* 16s., 1,085*l.*; "Bay Tree Cottage," Uxbridge-rd., Acton, and plot of land, f., 400*l.*; "Churchfield House," f., 500*l.*; a plot of f. land, Warpole Way, 115*l.*; 10, Chippenham Mews, Paddington, u.t. 69 yrs., g.r. 5*l.*, 170*l.*; 90, 92, and 94, Sydney-rd., Hornsey, u.t. 91 yrs., g.r. 18*l.* 18s., 630*l.*; 4, 4a 5, and 7, Stanley Villas, u.t. 90 yrs., g.r. 32*l.*, r. 82*l.*, 1,095*l.*; "Essenden," Anson-rd., Tufnell-pk., u.t. 90 yrs., g.r. 12*l.*, r. 85*l.*, 880*l.*; 5, 7, 9, 11, 21, and 23, Lacon-rd., Dulwich, u.t. 82 yrs., g.r. 42*l.*, 940*l.*; "Pellatt House," Pellatt-rd., u.t. 87 yrs., g.r. 6*l.*, 155*l.*; 22 and 24, Heber-rd., u.t. 85 yrs., g.r. 10*l.*, 170*l.*; 11, 13, and 57, Landcroft-rd., u.t. 85 yrs., g.r. 15*l.* 10s., 415*l.*; 58, Pelham-rd., Wimbledon, u.t. 88 yrs., g.r. 10*l.*, r. 30*l.*, 215*l.*; "Upton House" and "Rosenau House," Prince of Wales'-rd., Battersea, u.t. 88 yrs., g.r. 16*l.*, 805*l.*; 1, Gaskell-st., Clapham, u.t., 69 yrs., g.r. 4*l.* 3s., r. 30*l.*, 300*l.*; 1 and 2, Richmond Villas, Sutton, u.t. 93 yrs., g.r. 13*l.*, r. 70*l.*, 735*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	9/0/0	0/0/0
Teak, E.I. ..load	9/10/0	15/0/0
Sequoia, U.S.ft.cu.	2/3	2/6
Ash, Canada load	2/10/0	4/0/0
Birch, do.	3/5/0	4/10/0
Elm, do.	3/10/0	4/10/0
Fir, Dantsic, &c.	2/0/0	3/5/0
Oak, do.	3/0/0	5/5/0
Canada	5/10/0	7/0/0
Pine, Canada red	2/10/0	3/10/0
Do. Yellow	2/10/0	4/10/0
Lath, D'ntsic, fath	5/0/0	6/0/0
St. Petersburg..	5/0/0	7/0/0
Deals, Finland 2nd & 1st std	7/10/0	9/10/0
Do. 4th & 3rd ..	6/10/0	7/0/0
Do. Riga	6/10/0	8/0/0
St. Petersburg, 1st yellow	10/0/0	14/0/0
Do. 2nd yellow..	8/0/0	9/0/0
Do. white	7/10/0	9/10/0
Swedish	7/0/0	15/10/0
White Sea	8/0/0	16/10/0
Canada, Pine 1st	21/0/0	27/10/0
Do. do. 2nd	15/0/0	17/0/0
Do. do. 3rd &c.	7/10/0	10/0/0
Do. Spruce, 1st	8/10/0	11/0/0
Do. do. 3rd & 2nd	6/10/0	8/0/0
New Brunswick	6/10/0	7/10/0
Battens, all kinds	3/0/0	15/0/0
Flooring boards, sq., 1 in. prep. 1st	0/8/6	0/14/6
Do. 2nd	0/7/6	0/10/6
Other qualities—	0/4/0	0/7/6
Cedar, Cuba ..ft.	¼	¼
Honduras, ..&c	⅜	½
Mahogany, Cuba	½	⅝
St. Domingo, cargo av.	¼	1/6
Mexican do. do.	⅜	½
Tobasco do. do.	¼	⅛
Honduras do. ..	⅛	⅝
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio	9/0/0	20/0/0
Bahia	8/0/0	18/0/0
Satin, St. Domingo ..ft.	0/0/6	0/1/3
Porto Rico	0/0/7	0/1/6
Walnut, Italian ..	0/0/3½	0/0/7

METALS.		
Iron—Pig, in Scotland ..ton	2/0/5	0/0/0
Bar, Welsh, in London	5/17/6	6/0/0
Do. do. at works in Wales	5/7/6	5/10/0
Do. Staffordshire, in London	6/0/0	6/10/0
COPPER—British, cake and ingot	48/10/0	49/0/0
Best selected ..	49/15/0	50/5/0
Sheets, strong ..	57/0/0	58/0/0
Chili, bars	45/12/6	46/0/0
YELLOWMETAL lb	0/0 4	7-16 0/0/5¼
LEAD—Pig, Spanish ..ton	9/1c/0	0/0/0
English com. brands	9/12/6	0/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards	11/0/0	0/0/0
Pipe	11/10/0	0/0/0
ZINC—English sheet ..ton	21/10/0	0/0/0
Vieille Montagne	22/0/0	0/0/0
TIN—Straits	92/2/6	92/12/6
Australian	92/12/6	93/2/6
English Ingots..	95/5/0	95/10/0
Banca	92/15/0	93/0/0
Billiton	92/10/0	92/15/0

OILS.		
Linseed ..ton	22/5/0	22/10/0
Cocoanut, Cochin	31/0/0	0/0/0
Do. Ceylon	29/0/0	
Palm, Lagos	34/0/0	34/10/0
Rapeseed, English pale	27/10/0	28/0/0
Do. brown	25/15/0	26/0/0
Cottonseed ref.	26/0/0	
Oleine	20/10/0	21/10/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/10/0	12/0/0
TAR—Stockholm barrel	0/17/6	0/18/6
Archangel	0/12/6	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Thursdays.*]

ABERDOVEY.—For the erection of a chapel for the committee of the English Presbyterians. Mr. Richard Davies, architect, Bangor:—

Owen Morris	£1,257	William Jones Hughes, Aberdovey*	£590
Jones, Hughes & Edwards	705	James, Morris	588

*Accepted.

ALNWICK.—Accepted for the enlargement of schools, Glanton, for the Glanton and Shawdon School Board:—

Masons.—J. & S. Patterson, Branxton, Northumberland £103 5 0
Joiner.—J. Nicholas Pringle, Eglingham, Alnwick 98 17 6
Slater.—Thomas Miller, Glanton, R.S.O. 25 10 0
Plumbers.—Wilkin & Dickman, Glanton, R.S.O. 5 3 11

AMERSHAM (Bucks).—For the construction of a new system of drainage at the workhouse, for the Union Guardians. Mr. H. J. Gibbons, architect. Quantities by the architect:—

Sanitary Engineering Co.	£1,120 10 6	Stokes & Co.	£554 0 0
Williams & Son	700 0 0	Tolden Hipwell	530 0 0
J. C. Broderick	641 10 9	Geo. Cook	495 0 0
William Lee	587 10 0	Hiram Morecraft	472 0 0
Peattie & Axtell	577 0 0	Geo. Darlington, Amersham*	460 0 0
Charles Marchant	570 0 0		

* Accepted.

AMLWCH (Anglesey).—For building new manse at Amlwch. Mr. Richard Davies, architect:—

J. Roberts & Theo. Pritchard	£1,494 3	Thomas Griffith	£955 0
Evan Williams	1,212 0	Owen Thomas, Salem-street, Amlwch*	833 0

* Accepted.

ASPATRIA (Cumberland).—Accepted for the erection of a dwelling-house at Aspatria, for Mr. John Longcake. Mr. Thos. Stephenson, architect:—

Maxwell & Toppin £250 10 0

BEDFORD.—For beer bottling stores, &c., at Horne-lane Brewery, Bedford. Messrs. Usher & Anthony, architects, St. Paul's-square, Bedford:—

Warton	£2,100	Freshwater & Sons	£2,070
Foster	2,089	Spencer (accepted)	1,995

All of Bedford.

BEGELLEY (Wales).—Accepted for the extension of a Wesleyan chapel, at Stepaside:—

J. Preece James, Haverfordwest £237 10 0

BIDEFORD.—For the erection of stables and stores, for Messrs. R. Dymond & Son. Mr. R. T. Hookway, architect, Bideford, Devon:—

Backway	£610 0 0	Joint	£545 16 0
Ellis	546 19 11	Cock & Lamerton	537 10 0

[All of Bideford.]

BISHOPS CASTLE (Salop).—For the construction of a concrete service reservoir, &c., for the Clun Union Sanitary Authority. Mr. R. L. Bamford, surveyor, 138, Widemarsh-street, Hereford:—

J. Wilson & Sons	£1,795 10 0	Brown	£1,169 0 0
Baker	1,582 11 5	J. McKay	1,151 0 0
Bryan	1,405 0 0	Cooke & Anthony*	1,098 10 0
Welsh	1,300 0 0	Dale	1,097 3 0

* Accepted.

BRENTFORD.—For paving part of market site at Kew Bridge, with pitchings supplied, for the Brentford Local Board. Mr. J. H. Strachan, Engineer and Surveyor:—

Morecroft	£1,175 7 6	Nowell & Robson	£943 0 0
Griffiths	1,149 0 0	W. Parker	940 17 11
Mowlem & Co.	1,095 0 0	Broderick	929 14 6
J. Biggs	996 0 0	J. Ball, Chiswick*	905 0 0
Wimpey & Co.	956 0 0	Wheeler	891 0 0

* Accepted.

BRISTOL.—For new buildings, Southampton-parade, Redland, Bristol:—

Cowlin	£1,695	Hatherly & Carr	£1,567
Forse	1,680	Easterbrook	1,460
Jas. Wilkins	1,656	R. Wilkins	1,384
J. E. Davis	1,590	Beaven	1,350

CARDIFF.—For building new hotel at Cathays, Cardiff, for Messrs. Brain & Gottwaltz. Messrs. J. P. Jones, Richards, & Budgen, architects. Quantities by architects:—

E. T. Hatherly	£3,787 0 0	Jones & Co.	£3,348 0 0
W. Thomas & Co.	3,589 0 0	C. C. Dunn	3,343 8 10
H. Gibbon	3,430 0 0	Newby & Co.	3,329 18 11
Jones Bro.	3,400 0 0	D. Davies	3,319 0 0
G. H. Hodgkinson	3,399 19 9	W. Symonds	3,290 0 0
J. Allan	3,398 0 0	D. J. Davies	3,285 0 0
A. Berridge	3,368 10 0	R. Upham, Cardiff*	3,169 0 0
J. Hopkins	3,353 0 0		

*Accepted.

DAGENHAM (Essex).—For alterations and additions to the Beacontree Heath Schools, for the School Board for Dagenham. Messrs. Wigg, Oliver, & Hudson, architects, 80, Leman-street, E., and 7, Bedford-row, W.C. Quantities by Messrs. Goodman & Simpson:—

McCormick & Sons	£2,846 19 0	Hammond & Son	£2,302 18
Dowsing & Davis	2,547 15 0	W. Watson	2,289 0 0
Lorden & Son	2,538 0 0	Thos Bruby	2,274 18 4
John Gozzitt	2,405 0 0	Jas. Webb	2,190 0 0
Ernest West	2,307 0 0		

EASTBOURNE.—For alterations and additions to house, Langney-road, Eastbourne, for Mr. J. Fenton-Jones, J.P. Mr. W. A. Finch, architect, 76, Finsbury Pavement, E.C.:—

J. Peerless	£725	W. Backhurst (accepted)	£715

[Both of Eastbourne].

ERITH.—For the erection of a cottage, additional wards, &c., for infectious diseases hospital, Belvedere, for the Local Board. Mr. Harold Hurd, architect:—

G. Moles	£1,000 0 0	T. H. Walden	£810 0 0
Strickland & Chandler	936 15 0	C. Catlett	809 0 0
J. Stonehouse	910 0 0	G. H. Gunning, Erith*	704 18 6

* Accepted.

GUILDFORD.—For the erection of new Wesleyan Chapel and schools. Mr. F. Boreham, architect, 75, Finsbury Pavement, E.C. Quantities by Messrs. Northcroft, Son & Neighbour, 57, Charing Cross, S.W.:—

S. Ellis	£6,750 0	Kingerlee	£5,394 0
P. C. May	6,650 0	Bottrill & Son	5,350 0
Higlett & Hammond	6,232 0	Margett	5,333 0
Young & Lonsdale	6,220 0	Capp & Son	5,300 10
Holloway Bros.	6,113 0	Rowland Bros.	5,150 0
Mitchell Bros.	5,725 0	Downes	5,100 0
Harris & Son	5,700 0	A. A. Gale*	4,717 0
R. Wood	5,439 0		

* Accepted.

KENDAL.—Accepted for the erection of twelve dwelling-houses at the Lound, for the Co-operative Society. Mr. John Hutton, architect, Kendal. Quantities by architect:—

Builders.—Hill & Dixon, Kendal	£1,025 0 0	£2,658 19 4
Slater.—Jas. Bailey, Penrith	174 10 4	
Joiners.—Nelson Bros., Kendal	950 0 0	
Plasterers.—Lyon & Nicholson, Kendal	205 8 6	
Plumber, Gas and Water, and Smith's Work.—Lawrence Airey, Kendal	222 10 0	
Painter and Glazier.—Thos. Wileman, Kendal	81 10 6	

KESWICK.—For the extension of the sewer in Penrith-road, for the Local Board. Mr. W. Hodgson, surveyor, 3, Stanger-street, Keswick:—

Saunders & Wilkinson	£229 8 6	John Hunter, Maryport (accepted)	£216 16

LLANELLY.—For the erection and completion of six shops and club premises, Murray-street, Llanelly, for Mr. Gwilym Evans. Messrs. J. Buckley Wilson, and Glendinning Moxham, architects, Swansea:—

G. Mercer	£3,899 7	D. C. Jones & Co.	£3,230 0
J. D. Williams	3,765 0	J. P. Jones	3,200 0
Thomas Watkins & Co.	3,693 0	Gustavus Bros., Swansea (accepted)	3,170 0
Dd. Jenkins	3,350 0		

LONDON.—For engineering work, consisting of boilers, laundry and kitchen fittings, hot water supply apparatus, and other work at the New Infirmary, High-street, Lewisham, for the Guardians of the Poor of Lewisham Union. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C.:—

Wenham & Waters	£5,137	J. & F. May	£3,800
W. J. Fraser & Co.	4,680	Berry & Co.	3,438
Bradford & Co.	4,610	Benham & Son, Wigmore-street, W.*	3,215
Summerscales & Co.	4,330		
J. Fraser & Son	4,100		

*Accepted.

LONDON.—For rebuilding Nos. 3A, Wimpole-street, and 24, Wigmore-street, W., for Messrs. J. T. Bedford & Co. Mr. C. H. Worley, architect. Quantities by Mr. R. C. Gleed:—

J. Edgar	£6,683	Bush & Sons	£6,377
Simpson & Son	6,680	Holloway, Bros.	6,188
T. Boyce	6,580	Lawrance & Sons	6,175
G. H. & A. Bywaters	6,490		

LONDON.—For erecting the new offices of the Mercantile Marine Board, Well-street, E. Messrs. Wigg, Oliver, & Hudson, architects, 80, Leman-street, E., and 7, Bedford-row, W.C. Quantities by Messrs. C. Stanger & Son:—

T. Little	£9,293	M. Patrick & Son	£8,544
Garlick & Horton (Ltd.)	9,284	J. & H. Cocks	8,511
F. & F. J. Wood	9,250	W. Shurmur	8,461
Jas. Brown, Son, & Blomfield	8,917	J. O. Richardson	8,359
J. Sparks & Son	8,888	J. Bentley	8,351
Hearle & Farrow	8,706	W. Gladding, Byfield Works, Baker's-row, E.*	8,296
Harris and Wardrop	8,662		

* Accepted.

LONDON.—For the erection of a chrysanthemum-house at Finsbury Park, for the London County Council. Mr. Thomas Blashill, Architect:—

Marshall & Co.	£1,899 15 6	E. Houghton & Son	£1,027 0 0
W. D. Tucker	1,306 19 0	N. Lidstone	1,025 0 0
W. Edgcumbe Rendle & Co.	1,280 0 0	W. Parham	998 0 0
Jackson & Co.	1,200 0 0	J. Galbraith & Son	993 3 2
Reed, Blight & Co., Limited	1,179 0 0	W. Wells	981 0 0
F. & F. J. Wood	1,140 0 0	E. Triggs	980 0 0
J. Inwood	1,065 0 0	J. McCormick & Sons	978 0 0
W. H. Lascelles & Co.	1,030 0 0	C. Godbolt	959 0 0

LONDON.—For the erection of public conveniences, cart-shed, bothie, &c., at the Ladywell Recreation Ground, Lewisham, for the London County Council. Mr. Thomas Blashill, Architect:—

J. Watt	£774 10	J. Inwood	£641 0
F. W. Thomas	750 0	A. Wallis	598 0
W. Neil	667 0		

LONDON.—For alterations and additions to St. Mark's Schools, Whitechapel, E. Messrs. Wigg, Oliver, & Hudson, architects, 80, Leman-street, E., and 7, Bedford-row, W.C. Quantities by Mr. F. G. W. Buss:—

G. E. Weston	£1,616 13 4	J. Sparks & Son	£1,495 0 0

LONDON.—For sanitary and decorative work to 97, Highbury New Park, for Mr. A. Herring. Mr. E. J. Harrison, architect:—

Coombs	£252 0	E. Houghton & Son*	£161 0
Sturm	187 0	Gardiner & Hazel	159 12

*Accepted.

LONDON.—For painting, repairs, and other works at the Eastern Hospital, The Grove, Homerton, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15, Leaden-hall-street, E.C.:—

White & Son	£3,299 0 0	W. Wythe	£2,300 0 0
G. Foxley	2,990 0 0	Vigor & Co.	2,297 0 0
W. Wells	2,989 0 0	J. Hughes	2,181 0 0
E. Proctor	2,500 0 0	T. W. Eastwell	2,128 18 6
H. Wall & Co.	2,394 0 0	Stokes & Co.	2,100 0 0
Lilly & Lilly	2,374 0 0	M. Batchelor	1,942 0 0
W. F. Hadlow	2,367 0 0	Akers & Co., South Norwood*	1,729 0 0
H. Fullager	2,310 0 0		
W. & E. Mills	2,300 0 0		

* Accepted.

LONDON.—For enlarging the infants' department of the Hatfield street school, Blackfriars, by 74 places, and for carrying out other work, for the School Board for London. Mr. T. J. Bailey, Architect:—

Hart Bros.	£6,077	Co-operative Builders, Ltd.	£5,142
J. Shillitoe & Son	5,964	Kirk & Randall	5,070
W. Gregar & Son	5,833	Holliday & Greenwood	4,949
F. & H. F. Higgs	5,779	W. Downs	4,889
F. J. Coxhead	5,582	J. Tyerman, 220, Walworth road, S.E.*	4,708
D. Charteris	5,515		
J. Marsland	5,365		
H. Lovatt	5,356		

* The Works Committee propose that a painted dado should be substituted for glazed bricks to the staircase. The latter arrangement will reduce the amount of the lowest tender to £4,378, which the Committee recommend for acceptance.

LONDON.—For enlarging the Randall-place School, Greenwich, by 200 places, and for carrying out other works, for the School Board for London. Mr. T. J. Bailey, Architect:—

W. M. Dabbs	£2,694	F. J. Coxhead	£2,483
F. & H. F. Higgs	2,673	Kirk & Randall	2,330
W. Gregar & Son	2,632	Co-operative Builders, Limited, Brixton*	2,286
J. Smith & Sons	2,510		
J. Wilmott & Sons	2,508		

* Recommended by the Works Committee for acceptance.

LONDON.—For providing and fixing heating apparatus on the low pressure hot water system, with the necessary boiler, for the enlargement of the Orange-street School, Southwark, now in course of erection, and for the existing school, for the School Board for London. Mr. T. J. Bailey, Architect:—

Clarke & Sons	£450
G. Davis	405
Berry & Sons*	£360

*Recommended for acceptance by the Works Committee.

LONDON.—For making up roadway of William-Street, and making up and paving Dowell-mews, Fulham, for the Fulham Vestry. Mr. W. Sykes, New Streets Surveyor, Town Hall, Walham Green, S.W.:—

	William-street Roadway.	Dowell-mews (Asphalting).
G. Wimpey	£575 0 0	—
Mowlem & Co.	559 0 0	—
S. Hudson	520 0 0	—
E. Parry	517 10 0	—
J. Mears	536 0 0	—
H. J. Greenham	500 0 0	—
Serff Bros.	498 0 0	—
Nowell & Robson	593 0 0	£683 0 0
French Asphalte Co.	—	683 2 6 per yard.
Val de Travers Co.	—	0 12 0 per yard.
Limmer Asphalte Co.	—	646 17 6 per yard.

LONDON.—For the erection of new Fire Brigade Station and Mortuary, &c., for the Willesden Local Board. Messrs. Edmeston & Gabriel, architects, 42, Old Broad-street, E.C. Quantities by Messrs. Northcroft, Son & Neighbour, 57, Charing-cross, S.W.:—

R. A. Jerbury	£8,490 0 0	Young & Lonsdale	£7,730 0 0
A. G. Burton	8,375 0 0	Lorden & Son	7,698 0 0
Lawrence & Sons	8,370 0 0	W. Shepherd	7,677 0 0
Scharien & Co.	8,221 0 0	Tennant & Co.	7,665 0 0
F. G. Minter	8,200 0 0	J. Carmichael	7,542 0 0
Godfrey & Son	7,977 0 0	Gould & Brand	7,460 0 0
Houghton & Son	7,856 0 0	J. M. Goodwin	7,249 16 6
F. Chinchen	7,840 0 0	A. Kellett	7,112 0 0
R. Ballard	7,810 0 0	Godson & Sons*	5,360 0 0
S. J. Dainton	7,790 0 0		

*Withdrawn.

LONDON.—For the erection of new Public Library at Kilburn. Messrs. Edmeston & Gabriel, architects, 42, Old Broad-street, E.C. Quantities by Messrs. Northcroft, Son & Neighbour, 57, Charing-cross, S.W.:—

A. G. Burton	£2,513 0	S. J. Dainton	£2,250 0
Lawrence & Son	2,510 0	W. Shepherd	2,235 0
R. A. Jerbury	2,470 0	Gould & Brand	2,230 0
J. M. Goodwin	2,450 10	Young & Lonsdale	2,211 0
Scharien & Co.	2,423 0	F. G. Minter	2,200 0
R. Ballard	2,347 10	Houghton & Son	2,198 0
Tennant & Co.	2,319 0	J. Carmichael	2,158 0
Godfrey & Son	2,297 0	A. Kellett	2,150 0
Lorden & Son	2,297 0	Godson & Sons	2,140 0
F. Chinchen	2,290 0		

LONDON.—For fitting up shop, Kentish Town-road:—

Durnford Bros.	£114 0 0	Hewitt, Chiswell-st.*	£102 10 0

* Accepted.

LONDON.—For new mansions at No. 17, Stratton-street, fronting on Curzon-street, Mayfair, W. Mr. Robert J. Worley, architect, 46, Cannon-street, E.C. Messrs. R. C. Gleed and R. L. Curtis & Sons, surveyors:—

Perry & Co. (accepted) £24,282 0 0

OXFORD.—For the erection of the Oxford Municipal Buildings and Town Hall. Mr. H. T. Hare, architect:—

Pethick Bros.	£71,414 0 0	S. G. Halliday	£57,701 0 0
W. H. Lorden & Son	62,161 14 8	H. Willcock & Co.	55,557 0 0
A. Kellett	59,893 19 11	T. Martin	55,500 0 0
S. Hutchins	58,352 12 11	Parnell & Son	55,276 12 0
Henry Lovatt	58,286 0 0	De Vere Buckingham, & Co.	54,243 0 0
Kirk & Randall	57,720 0 0	John T. Chappell	51,663 0 0

PLASHET (Essex).—For the erection and completion of a school at Plashet, for the East Ham School Board. Mr. R. L. Curtis, architect. Quantities supplied:—

Lidstone	£18,295	Allen	£17,390
McCormick	17,945	Kirk & Randall	17,247
Lascelles	17,750	Gregar	17,200
Hearle & Farrow	17,644	Smith	16,850
J. O. Richardson	17,568	Watson	16,557
Maddison	17,457		

PRESTON.—For the erection of the superstructure of the Cross Deaf and Dumb School. Messrs. Sames & Green, architects, 65, Northgate, Blackburn. Quantities by the architects:—

E. Lewis & Son	£6,900 0	John Christian, Grimshaw-st., Preston*	£6,385 0
C. Walker	6,703 0	Tullis & Son	6,340 13
John Walmsley	6,660 0	M. Shorrock	6,292 5
William Hothersall	6,613 0		
Thomas Cottam	6,602 11		

* Accepted.

Foundations.—John Christian (accepted) £750 0 0

SOUTHAMPTON.—For the enlargement of school buildings, Sholing, for the St. Mary Extra and Hound School Boards. Messrs. W. H. Mitchell, Son & Gutteridge, architects, 9, Portland-street, Southampton:—

H. Cawte	£774 0	Rowland & Son	£728 0
A. Warden	770 10	J. Hinton	710 0
S. Nichols	741 0	S. J. Jukes, Freemantle*	688 0
H. Stevens & Co.	730 0		

* Accepted subject to approval of the Education Department.

TONBRIDGE.—Accepted for the erection of a pair of cottages at Hilden, near Tonbridge, for the Messrs. Auldjo. Mr. R. Owen Allsop, architect:—

G. & F. Penn, Pembury £488 17

TONNA (Wales).—For the erection of twelve houses, Aberdulais, for the Aberdulais Building Society. Mr. James Preece, architect, 1, St. Anne's-terrace, Aberdulais. Quantities by Mr. James Preece:—

David Dodd	£2,400 0 0	Thos. Hill, Aberdulais*	£1,848 10
Walter Dowland	2,184 0 0	A. George (withdrawn)	1,805 0

* Accepted.

TUNBRIDGE WELLS.—For the supply of 3,100 yards of 9-in. cast-iron pipes for the Town Council. Mr. W. Brentnall, C.E., Borough Engineer, Town Hall, Tunbridge Wells:—

R. Laidlaw & Son	£1,072 19 0	Clay Cross Co.	£994 12 4
Britley Iron Co.	1,067 14 3	J. Oakes & Co.	979 18 0
Macfarlane, Strang & Co.	1,041 10 5	J. & S. Roberts	972 10 9
Stanton Iron Works Co.	1,038 10 5	Cochrane & Co.	959 18 10
Jukes, Coulson, Stokes & Co.	1,033 4 3	Firmstone & Co.	946 17 0
J. Coates & Co.	1,013 6 0	Cochrane, Grove & Co.	960 8 10
Stewart & Co.	1,001 17 0	Staveley Coal and Iron Co.	912 16 0

WALTHAM CROSS.—For the erection of new house and shop at Waltham Cross, N., for the Colvin estate. Messrs. Wigg, Oliver, & Hudson, architects, 80, Leman-street, E., and 7, Bedford-row, W.C. Quantities by Messrs. Goodman & Simpson:—

W. Shurmur	£2,259	J. Bentley, Sun-street, Waltham Abbey*	£1,774
W. Gardener	1,800		
L. & W. H. Patman	1,792		

* Accepted.

WALTHAMSTOW.—For making-up and laying concrete flags, Pretoria Avenue (North), for the Local Board. Mr. George W. Holmes, Surveyor, Town Hall, Walthamstow:—

Making-up.

J. Jackson	£126 0 0
G. Bell, Tottenham (accepted)	117 0 0
J. E. Bloomfield	108 0 0

Paving.

	s. d.
Constable & Co.	5 6 per sq. yd,
Victoria Stone Company	4 9 " "
Woodham, Fry, & Fry	4 7 " "
Jones's Annelated Concrete Company, Middlesborough (accepted)	4 7 " "
Indurated Stone Company	4 6 " "

WANSTEAD.—Accepted for additions and drainage, &c., to each lodge, Great Blake Hall, Wanstead, Essex. Mr. Herbert Riches, architect, 3, Crooked Lane, King William-street, E.C.:—

W. Mundy £200 0 0

WIMBLEDON.—Accepted for painting and redecorating twenty-nine houses in Haydon-road, for Mr. E. H. Peach:—

Tremain & Piper, Tottenham. Scheduled prices.
[No competition.]

WORTHING.—For the erection of relief and other offices, for the East Preston Guardians. Mr. R. Singer Hyde, architect, 23, Eriswell-road, Worthing:—

W. W. Sandell	£641 18 0	J. East, West Tarring*	£590 0 0
F. Sandell	620 0 0	W. H. Sawle	586 0 0
F. G. King	610 0 0		

* Accepted.

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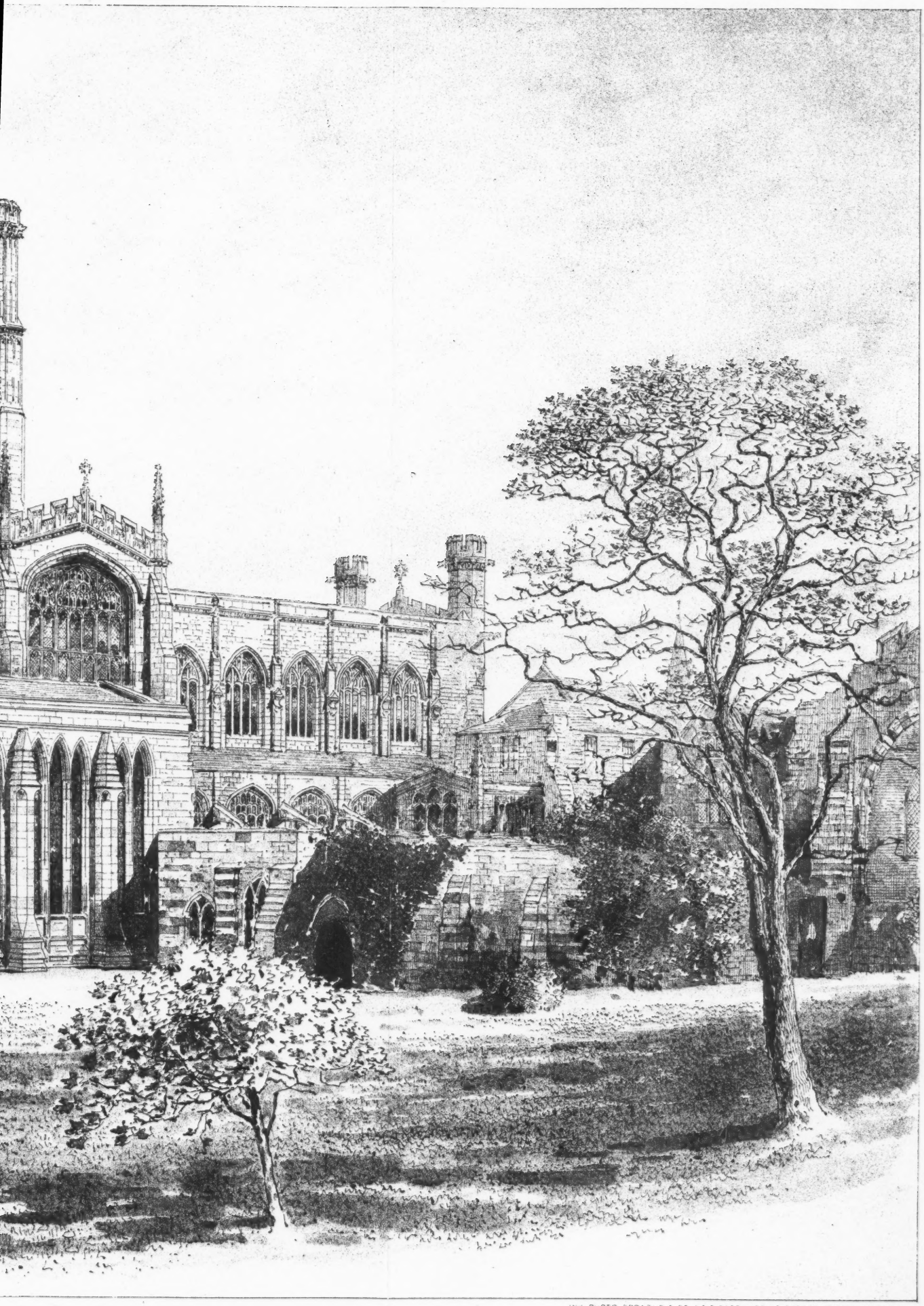
Cathedrals of England and

No. 28. CHESTER: NORTH-EAST VIEW FROM CITY WALL

1893.

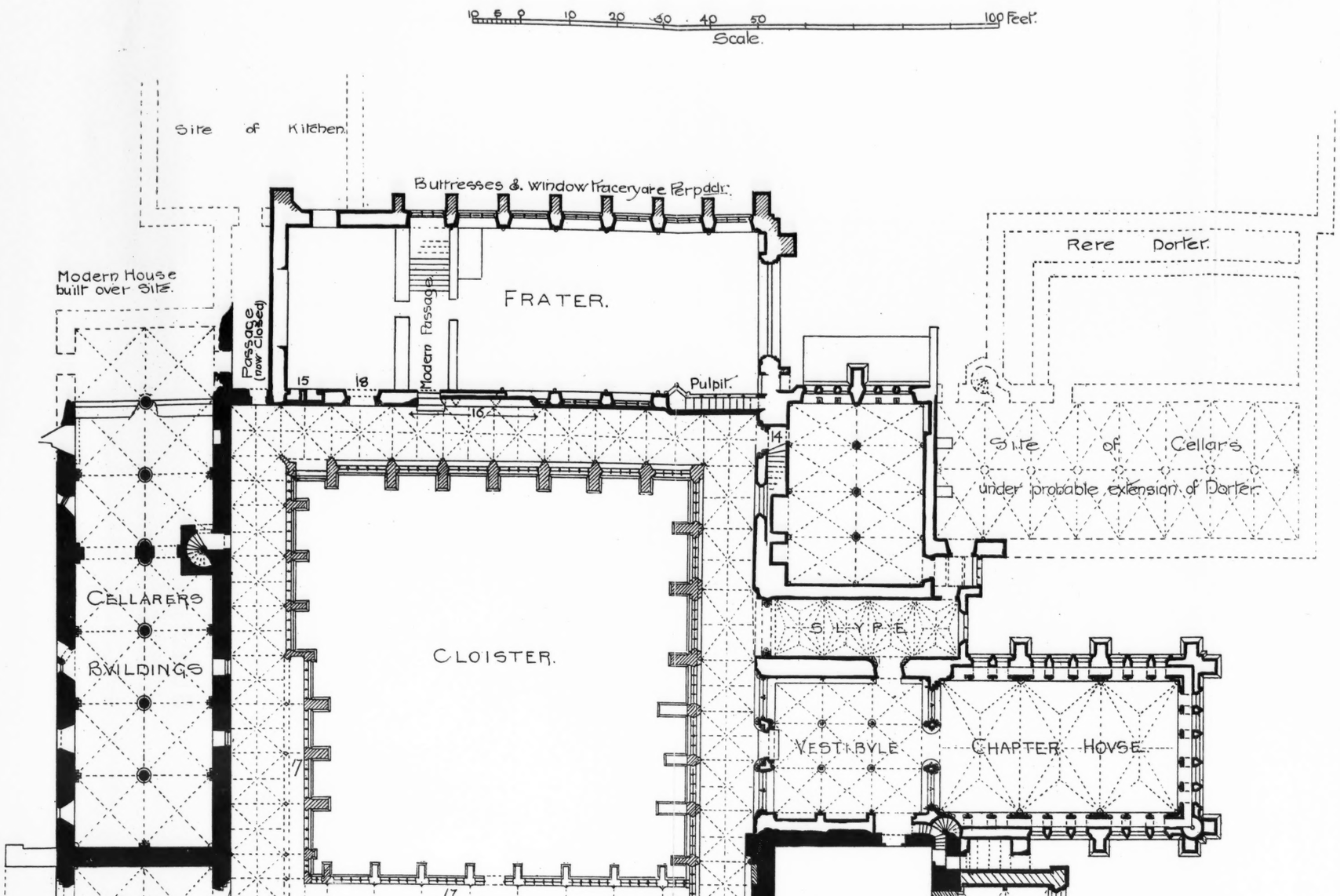


INK PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

d and Wales.

Y WALLS.—Drawn by Mr. E. Hodkinson.

CHESTER CATHEDRAL
GROUND PLAN.



Monuments, etc.

1. Bases of piers of Norman Choir.
2. Remains of Norman Apse.
3. ditto ditto.
4. Two recessed Tombs.
5. Sedilia.
6. Piscina & Credence. } Formerly one bay further west.
7. Tomb
8. Portions of old Organ Screen.
9. The Shrine of Saint Werburgh.
10. Monument - Bishop Graham (1848-65).
11. Traces of a fireplace.
11a. Remains of Apse of Norman Chapel.
12. Modern mon.t to Bishop Pearson (1686).
13. Piscina & Sedile (restored).
14. Stairs from Cloister to Dorter.
15. Recessed Cupboards.
16. The Lavatory (extent shown by arrows).
17. Carols in W. & S. walks of Cloister.
18. Entrance to Frater. (now disused).

Note. The monastic buildings now destroyed are given in Lysons History of Cheshire from plan in Harl. MSS. 2073.

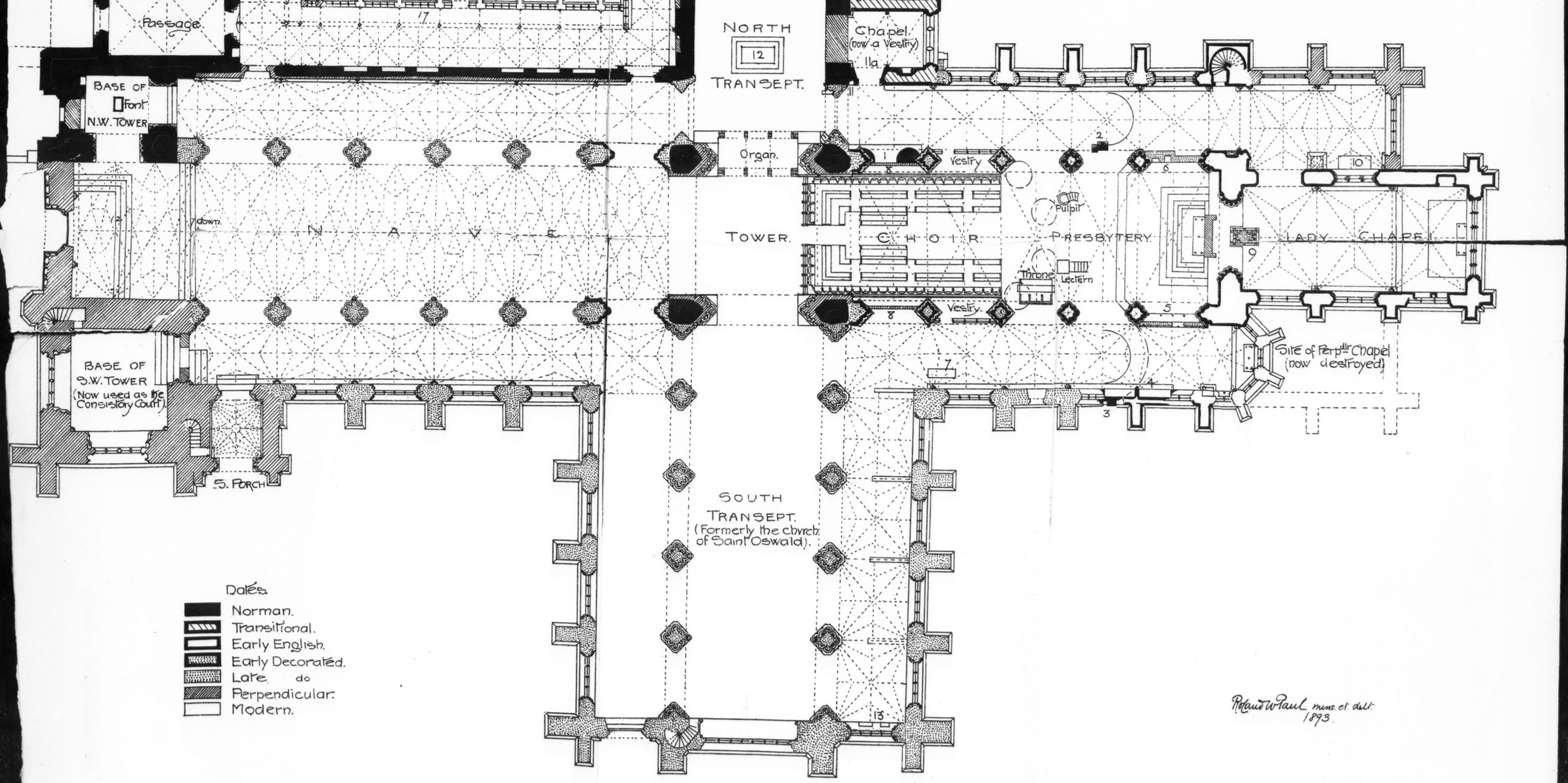
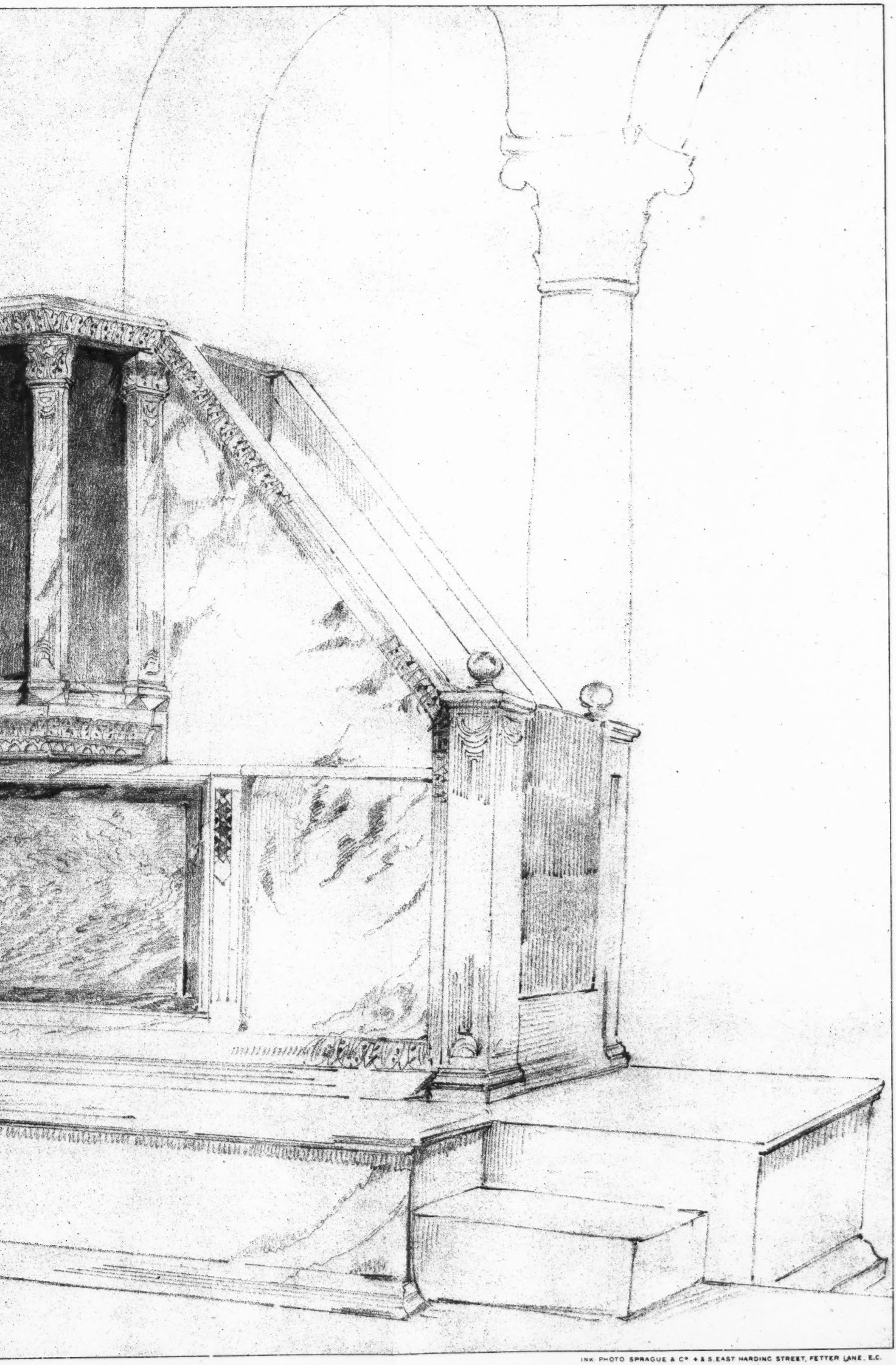


PHOTO LITHO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

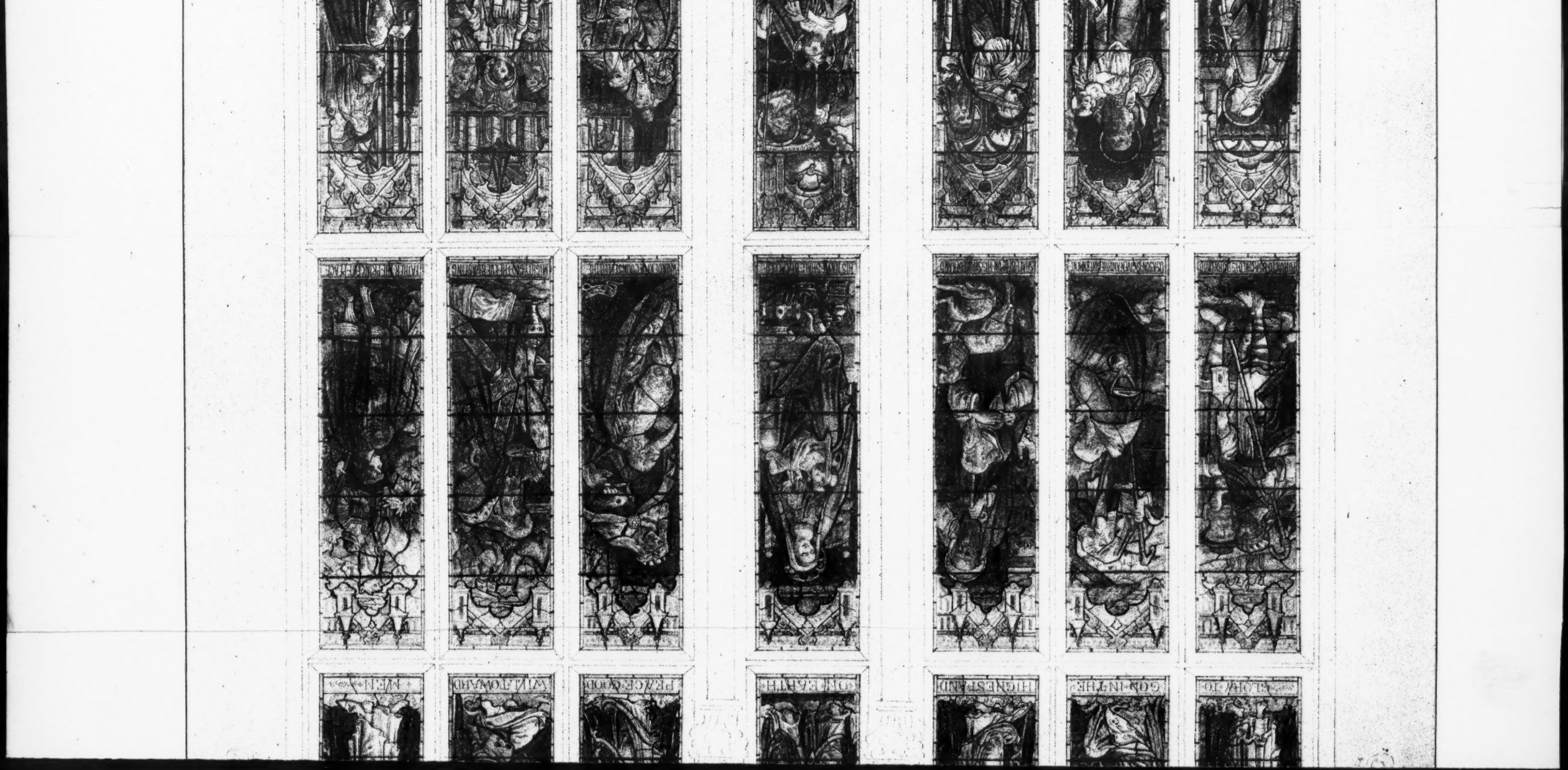
AMBO, S. MARIA IN COSMEDIN, ROME.—From a Dra



INK. PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

ROM A DRAWING BY MR. GERALD C. HORSLEY.

GLORY TO GOD IN THE HIGHEST AND ON EARTH PEACE GOOD WILL TOWARD + MEN +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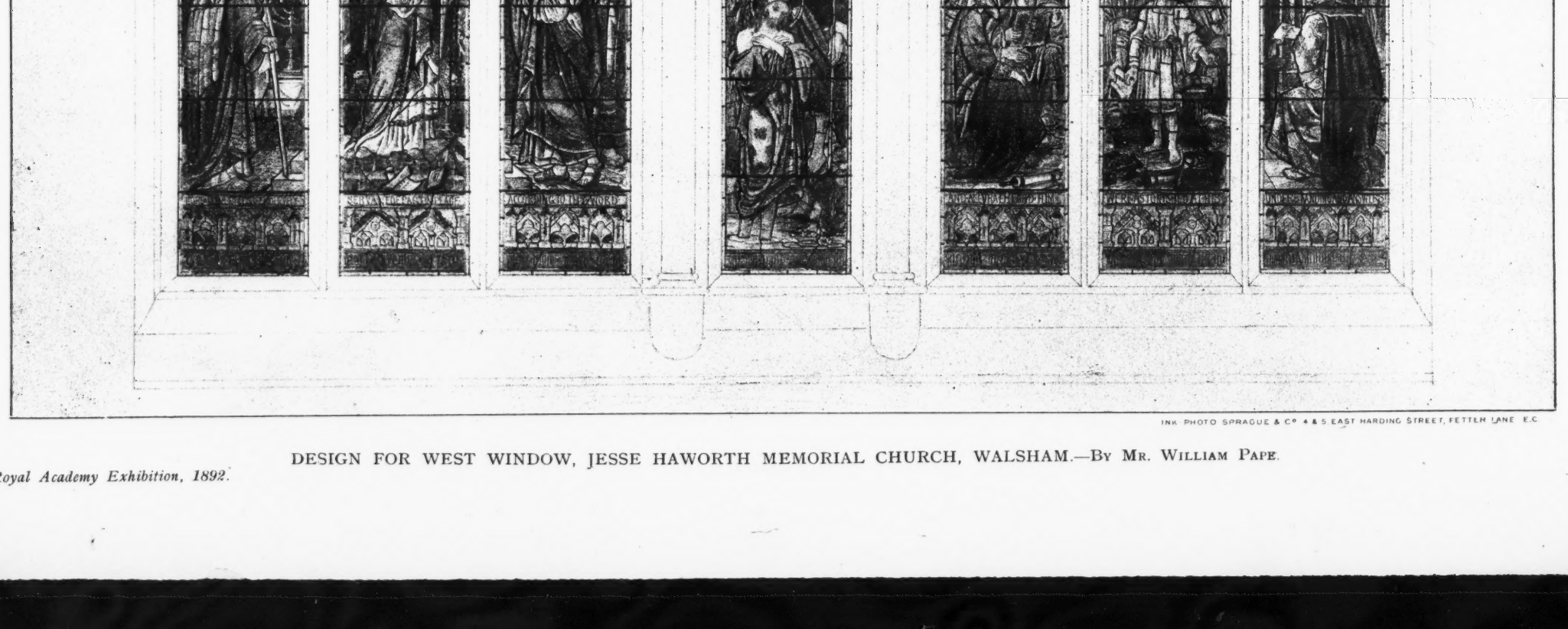

INK PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

DESIGN FOR WEST WINDOW, JESSE HAWORTH MEMORIAL CHURCH, WALSHAM.—By Mr. William Pape.

Royal Academy Exhibition, 1892.